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ABSTRACT

A revised version of the Individual Development and Educational Assessment (IDEA) form for collecting student ratings of instructional processes and outcomes has been administered since the fall of the 1998-1999 school year. Results from all implementations of the instrument from August 1998 through August 2001 are the basic data of this report. A total of 122 institutions of higher education from different parts of the United States participated in this program; reports were prepared for 73,722 classes, of which 29,267 used a short form and 44,455 used the long (Diagnostic) form. The report is organized into six parts: (1) basic data, including means, standard deviations, norms for types of institutions, and intercorrelations of all items; (2) the structure of the ratings; (3) the process of adjusting ratings; (4) reliability; (5) validity; and (6) other technical questions. Appendix A, published separately, contains sample forms and reports. Appendixes B and C contain details on calculating scores and regression coefficients and constants. (Contains 26 tables.) (SLD)

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ED 469 477

Individual Development and Educational Assessment

Technical Report No. 12

Basic Data for the Revised IDEA System

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August 2002

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Introduction

A revised version of the IDEA form for collecting student ratings of instructional processes and outcomes has been administered since the fall term of the 1998-99 school year[1]. Results from all administrations of the device from August 1998, through August 2001, constitute the basic data of this report. A total of 122 institutions of higher education participated in the program during this time span; reports were prepared for 73,722 classes[2], of which 29,267 used the Short Form and 44,455 used the Diagnostic (long) Form.

No claim is made that participants are representative of American higher education. However, they are relatively diverse, both geographically and in mission. Table 1 shows information about the highest degree offered by participating institutions as well as their geographic location.

Table 1
Number of Institutions Included in Research

Location	Highest Degree Offered					
	Associate	Baccalau-reate	Master's	Doctoral	Other	Total
Southeast	4	2	4	2	3	15
East/Northeast	7	5	9	5	0	26
Midwest	8	5	17	10	8	48
Southwest	5	3	5	4	1	18
Rockies/West	4	5	2	4	0	15
Total	28	20	37	25	12	122

Fifty-five institutions were publicly supported, 44 were private not-for-profit, of which many were church related, and 23 were private for-profit. Enrollment varied widely from under 500 (11 institutions) to over 20,000 (9 institutions). The two most common size categories were 1000-2499 (28 institutions) and 5000-9999 (29 institutions).

In terms of classes processed, 22 percent were from two-year institutions, 14 percent from those whose highest degree offered was the bachelor's, 28 percent from Master's degree institutions, 23 percent from doctoral institutions, and 13 percent from other types of institutions.

This report is organized into six parts.

I. Basic Data (including means, standard deviations, norms for types of institution, and inter-correlations of all items)
II. The Structure of the Ratings
III. The Process of Adjusting Ratings
IV. Reliability
V. Validity
VI. Other Technical Questions

Section I. Basic Data

This section presents item means, standard deviations, and inter-correlations as well as percentile ranks for all institutions and for each of four types of institutions (defined by highest degree offered). The data are based on the 44,455 classes that employed the Diagnostic Form in the time period from August 1998, through August 2001.

Table 2 describes faculty ratings of the importance of the 12 learning objectives as reported on the Faculty Information Form (FIF). A 3-point rating scale was used for these 12 items: "1=Of no more than minor importance;" "2=Important;" and "3=Essential." The table shows the number of classes for which a given objective was identified as "important" or "essential," the mean and standard deviation, and the percent of classes where the objective was identified as "essential" or "important."

Table 2
Faculty Ratings of the Importance of Twelve Learning Objectives

Learning Objective	N (Important & Essential)	% Important [a]	% Essential [a]	Mean [b]	s.d.
1. Gaining factual knowledge (trends, etc.)	31,991	32	46	2.24	.79
2. Learning fundamental principles, generalizations, or theories	30,398	34	41	2.16	.80
3. Learning to apply course material (to improve thinking, problem solving, and decisions)	30,442	40	35	2.10	.77
4. Developing skills, competencies, and points of view needed by professionals	21,568	30	25	1.80	.81
5. Acquiring skills in working as a team member	12,088	24	8	1.39	.63
6. Developing creative capacities--writing, art, etc	9,290	15	10	1.34	.65
7. Gaining a broad understanding, appreciation of intellectual/cultural activity (music, science, etc.)	10,256	17	10	1.37	.66
8. Developing skill in expressing oneself orally or in writing.	18,174	26	20	1.67	.79
9. Learning how to find and use resources	15,656	31	10	1.51	.67
10. Developing a clearer understanding of, and commitment to, personal values.	8,715	17	6	1.30	.58
11. Learning to analyze and critically judge ideas	18,909	29	20	1.68	.78
12. Acquiring an interest in learning more	15,616	30	11	1.52	.68

[a]Percentages based on all classes employing the Diagnostic Form. Percentages will not equal 100 because the percentage indicting the objective was "Of minor or no importance" are not reported.

[b]A 3-point rating scale was used: 1=Of no more than minor importance, 2=Important, 3=Essential.

A review of Table 2 provides an indication of the instructional priorities of those participating in the IDEA program. The first four objectives are stressed most frequently; these represent the acquisition and application of basic cognitive background, often as a part of professional preparation. Academic skills (8. communication; 11. critical analysis) were also stressed frequently, but not as often as the first four objectives. Next in importance were the two "life-long learning" objectives (9. finding and using resources; 12. interest in learning more). The objectives that were stressed least were those concerned with values development (item 10), creative capacities (item 6), and a broad liberal education (item 7). American higher education is often portrayed as pragmatic and utilitarian; these results are consistent with that stereotype.

Table 3 gives the mean, standard deviation, and number of classes for the 47 individual items rated by students. A 5-point rating scale was used throughout, with "1" representing the lowest rating (least

frequent, least characteristic, least satisfactory) and "5" the highest rating.

In addition, two "overall effectiveness" measures were included—PRO (Progress on Relevant Objectives) and PRO_{adj}. PRO was derived by combining the faculty member's ratings of "Importance" of a given objective with the average student rating of "Progress" on that objective. Because the average student rating of progress is different for each of the 12 learning objectives, these averages were first expressed as T Scores, a mathematical way of converting all averages to 50 and all standard deviations to 10[3]. These T Scores were then weighted by the faculty member's rating of the importance (relevance) of each objective. For objectives rated as "Essential," the T Score was multiplied by 2 before being added to the T Score for objectives chosen as "Important;" objectives rated as "Of no more than minor importance" were ignored. The PRO measure was derived by dividing the sum of the weighted T Scores by the sum of the weights. The PRO_{adj} measure adjusts PRO by taking into account factors which influence student ratings but which are beyond the control of the instructor. The adjustment process is described in Section III of this report.

For the student ratings shown in Table 3, it should be noted that, although "3" was the midpoint of the rating scale, all ratings averaged above "3" and 13 of them averaged above "4." While these relatively high ratings probably reflect a generally high quality of instruction being provided at participating institutions, they are also due in part to a tendency for students to be "lenient" in their ratings. This is revealed most clearly in those items where students are asked to compare the class with others they have taken (Items 33-35), where averages were 3.20, 3.42, and 3.42, respectively—well above the average which would be expected if leniency were not an issue.

Table 3
Student Ratings of Individual Items on the IDEA Diagnostic Form

Student Ratings of Teaching Methods	N	Mean	s.d.
1. Displayed a personal interest in students and their learning.	44,451	4.34	.50
2. Found ways to help students answer their own questions.	44,448	4.10	.52
3. Scheduled course work in ways which encouraged students to stay up-to-date in their work.	44,447	4.20	.48
4. Demonstrated the importance and significance of the subject.	44,447	4.32	.45
5. Formed "teams" or "discussion groups" to facilitate learning.	44,446	3.52	1.03
6. Made it clear how each topic fit into the course.	44,444	4.20	.51
7. Explained criticisms of students academic performance.	44,445	3.78	.57
8. Stimulated students to intellectual effort beyond that required by most courses.	44,443	3.86	.57
9. Encouraged students to use multiple resources to improve understanding.	44,444	3.78	.70
10. Explained course material clearly and concisely.	44,446	4.13	.61
11. Related course material to real life situations.	44,444	4.22	.58
12. Gave tests, projects, etc. that covered the most important points of the course.	44,440	4.28	.49
13. Introduced stimulating ideas about the subject.	44,443	4.03	.58
14. Involved students in "hands on" projects (research, etc.).	44,443	3.76	.80
15. Inspired students to set and achieve goals which really challenged them.	44,446	3.76	.62
16. Asked students to share ideas and experiences with others with different backgrounds and viewpoints.	44,445	3.69	.79
17. Provided timely and frequent feedback on tests, projects, etc.	44,443	4.11	.59
18. Asked students to help each other understand ideas, concepts.	44,444	3.79	.64
19. Gave projects, tests, etc. that required original thinking.	44,445	3.92	.65
20. Encouraged student-faculty interaction outside of class.	44,446	3.90	.63
44. Used a variety of methods to evaluate student progress.	44,442	3.83	.60
45. Expected students to take their share of responsibility for learning.	44,442	4.30	.33
46. Had high achievement standards in this class.	44,442	4.13	.41
47. Used educational technology to promote learning.	44,442	3.63	.77
Student Ratings of Progress			
21. Gaining factual knowledge (terminology, etc.)	44,443	3.94	.52
22. Learning fundamental principles, generalizations, or theories	44,442	3.89	.51
23. Learning to apply course material (to improve thinking, problem solving, and decisions)	44,440	3.95	.52
24. Developing skills, competencies, and points of view needed by professionals in the field most closely related to this course	44,441	3.91	.54
25. Acquiring skills in working with others as a team member	44,437	3.45	.82
26. Developing creative capacities (writing, inventing, etc.)	44,438	3.37	.79
27. Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc.)	44,440	3.32	.74
28. Developing skill in expressing oneself orally or in writing	44,439	3.41	.80
29. Learning how to find and use resources for answering questions or solving problems	44,435	3.58	.60
30. Developing a clearer understanding of, and commitment to, personal values	44,434	3.44	.69
31. Learning to analyze and critically evaluate ideas, etc.	44,436	3.67	.63
32. Acquiring an interest in learning more	44,437	3.74	.56
Ratings of Course Characteristics			
33. Amount of reading	44,447	3.20	.74
34. Amount of work in other (non-reading) assignments	44,445	3.42	.59
35. Difficulty of subject matter	44,445	3.42	.58
Self-Ratings			
36. I had a strong desire to take this course.	44,447	3.66	.67
37. I worked harder on this course than on most I have taken.	44,448	3.57	.56
38. I really wanted to take a course from this instructor.	44,447	3.40	.67
39. I really wanted to take this course regardless of who taught it.	44,447	3.33	.56
43. As a rule, I put forth more effort than other students on my academic work.	44,443	3.64	.31
Global Ratings of Outcomes			

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40. As a result of taking this course, I have more positive feelings toward this field of study.	44,447	3.86	.60
41. Overall, I rate this instructor an excellent teacher.	44,447	4.18	.64
42. Overall, I rate this course as excellent.	44,447	3.92	.61
Progress on Relevant Objectives (PRO)[a]	42,785	50.9	8.7
PRO-Adjusted	42,344	51.0	8.5

[a]PRO ratings are standardized T Scores. The distribution has a mean of 50 and standard deviation of 10. All other ratings were made on a 5-point scale where 1 is low and 5 is high.

Inter-correlations for all items included in Tables 2 and 3 are provided in Tables 4, 5, and 6. Refer to Tables 2 and 3 for item descriptions.

The correlations shown in these tables may seem overwhelming. Aside from their value as basic information, they can help the reader gain a deeper understanding of individual ratings. For example, there may be interest in understanding factors that relate to how hard students work in a class (Item 37: "I worked harder on this course than on most courses I have taken"). As shown in Table 6, although a substantial number of items were significantly correlated with responses to this item, the highest correlations were with items related to the instructor's course management and/or expectations. Thus, means on this item correlated .68 with the amount of other (non-reading) work assigned in the course (Item 34), .67 with the difficulty of the course (Item 35), .66 with the instructor's achievement standards (Item 46), and .54 with the instructor's tendency to hold students responsible for their own learning (Item 45). Similarly, the perceived difficulty of a course (Item 35) was largely a function of the magnitude of assignments given (reading, Item 33; other, Item 34) as well as the instructor's achievement standards (Item 46) and success in stimulating student effort (Item 8). Detailed analyses such as these can result in new insights regarding teaching, learning, and the IDEA system.

Table 4
Inter-Correlations of IDEA Faculty Information Form
Faculty Ratings (FR)

Item	FR1	FR2	FR3	FR4	FR5	FR6	FR7	FR8	FR9	FR10	FR11	FR12
FR1	1.00											
FR2	.42	1.00										
FR3	.13	.28	1.00									
FR4	.13	.10	.30	1.00								
FR5	-.03	.04	.27	.26	1.00							
FR6	-.11	-.04	.13	.21	.29	1.00						
FR7	-.04	-.01	-.03	-.04	.12	.33	1.00					
FR8	-.22	-.14	.06	.01	.31	.34	.24	1.00				
FR9	.07	.10	.32	.25	.34	.28	.17	.38	1.00			
FR10	-.00	.08	.21	.10	.29	.22	.26	.26	.32	1.00		
FR11	-.11	.07	.23	.00	.22	.24	.27	.46	.41	.38	1.00	
FR12	.13	.20	.33	.22	.34	.30	.30	.32	.52	.45	.50	1.00

See Table 2 for item descriptions.

Table 5
Inter-Correlations of IDEA Faculty Information Form (FR)
and IDEA Diagnostic Form (SR)

Item	FR1	FR2	FR3	FR4	FR5	FR6	FR7	FR8	FR9	FR10	FR11	FR12
SR1	-.07	-.06	.00	.05	.04	.05	.00	.04	.01	.07	.00	.03
SR2	-.08	-.06	.03	.05	.04	.04	-.01	.04	.01	.07	.02	.04
SR3	-.03	-.05	.02	.04	.00	.02	-.03	.03	-.01	.00	-.03	-.01
SR4	.02	-.01	.01	.06	.00	-.01	-.03	-.02	-.02	.09	-.02	.02
SR5	-.24	-.18	.06	.06	.36	.08	-.02	.23	.08	.12	.10	.04
SR6	.01	-.03	-.01	.03	.02	-.02	-.01	-.01	-.04	.07	-.02	.00
SR7	-.15	-.12	.01	.09	.09	.16	.02	.14	.04	.06	.05	.03
SR8	-.05	-.03	.03	.05	.03	.04	.00	.05	.02	.04	.06	.03
SR9	-.14	-.14	.02	.07	.12	.10	-.01	.21	.22	.06	.12	.06
SR10	.00	-.03	-.03	-.02	-.03	.00	.01	.02	-.03	.04	-.01	.00
SR11	.02	.02	.07	.07	.06	-.07	-.10	-.02	.00	.14	.02	.03
SR12	.13	.07	.02	.01	-.06	-.10	-.06	-.11	-.06	-.02	-.09	-.03
SR13	-.04	-.05	-.02	.02	.03	.05	.07	.04	.00	.13	.06	.06
SR14	-.12	-.13	.10	.23	.25	.13	-.08	.08	.15	.07	.00	.04
SR15	-.12	-.10	.06	.15	.13	.14	-.03	.08	.08	.09	.02	.05
SR16	-.22	-.17	.00	.03	.17	.12	.06	.24	.09	.23	.19	.12
SR17	.01	.00	.00	.01	-.02	-.02	-.03	.02	-.03	.00	-.02	-.01
SR18	-.17	-.13	.05	.10	.20	.09	-.02	.12	.05	.10	.05	.05
SR19	-.24	-.18	.03	.09	.14	.24	.07	.26	.11	.10	.15	.07
SR20	.06	-.05	.01	.03	.04	-.02	-.06	.03	.02	.00	.01	-.01
SR21	**.21**	.11	.04	.12	-.05	-.09	-.10	-.17	-.05	-.05	-.11	-.02
SR22	**.14**	**.17**	.09	-.11	-.02	-.07	-.13	-.17	-.06	-.01	-.07	.00
SR23	**-.04**	**-.01**	**.14**	.19	.07	.03	-.16	-.03	.02	.04	-.04	.01
SR24	**.00**	**-.03**	**.08**	**.26**	.08	.07	-.14	-.04	.02	-.00	-.08	.00
SR25	**-.18**	**-.14**	**.10**	**.15**	**.39**	.08	-.07	.14	.09	.08	.02	.04
SR26	**-.32**	**-.27**	**-.04**	**.10**	**.17**	**.37**	.17	.35	.12	.11	.16	.09
SR27	**-.18**	**-.18**	**-.11**	**-.02**	**.08**	**.25**	**.33**	.22	.05	.14	.14	.11
SR28	**-.32**	**-.26**	**-.04**	**.01**	**.17**	**.19**	**.12**	**.46**	.13	.16	.24	.09
SR29	**-.10**	**-.10**	**.08**	**.12**	**.12**	**.05**	**-.09**	**.16**	**.21**	.02	.08	.05
SR30	**-.16**	**-.11**	**.03**	**.05**	**.13**	**.08**	**.02**	**.15**	**.08**	**.28**	.15	.11
SR31	**-.21**	**-.12**	**.02**	**-.02**	**.08**	**.08**	**.03**	**.23**	**.07**	**.16**	**.27**	.08
SR32	**-.09**	**-.06**	**.05**	**.10**	**.08**	**.07**	**-.02**	**.06**	**.06**	**.11**	**.08**	**.09**
SR33	.01	.01	-.04	-.13	-.05	-.18	.08	.13	.00	.06	.21	.03
SR34	-.06	-.05	.12	.19	.08	.12	-.12	.06	.07	-.13	-.06	-.05
SR35	.16	.17	.05	.02	-.12	-.11	-.08	-.16	-.08	-.18	-.05	-.07
SR36	.08	.03	.03	.26	.07	.11	-.04	-.11	-.02	.05	-.10	.05
SR37	.04	.03	.07	.16	.01	.06	-.10	-.02	.00	-.10	-.04	-.03
SR38	-.01	-.03	.01	.13	.04	.04	-.04	-.06	-.03	.02	-.07	-.01
SR39	.08	.04	.06	.25	.09	.10	-.05	-.09	.01	.03	-.10	.05
SR40	.04	-.01	.02	.18	.05	.07	-.02	-.06	-.02	.08	-.06	.04
SR41	-.03	-.05	-.03	.00	-.01	.02	.01	.02	-.03	.04	.00	.00
SR42	.00	-.03	-.01	.11	.03	.08	.00	-.01	-.03	.07	-.04	.03
SR43	.00	-.02	.07	.17	.09	.05	-.03	-.05	.02	.01	-.04	.01
SR44	-.12	-.12	.08	.15	.16	.09	-.03	.12	.07	.05	-.01	.02
SR45	-.04	-.06	.01	.10	.04	.03	-.03	.01	-.01	.01	-.01	.00
SR46	-.03	-.05	.02	.10	.02	.05	-.04	.04	-.01	-.01	.00	-.02
SR47	.00	-.07	.07	.14	.09	-.01	-.10	.00	.14	-.07	-.05	-.01

Bold numbers are correlations between student (SR21-SR32) and faculty ratings (FR1-FR12) of the twelve learning objectives.

See Tables 2 and 3 for item descriptions.

Table 6
Inter-Correlations of IDEA Student Ratings (SR) – Diagnostic Form

	SR1	SR2	SR3	SR4	SR5	SR6	SR7	SR8	SR9	SR10	SR11	SR12	SR13	SR14	SR15	SR16	SI

Item																	
SR1	1.0																
SR2	.88	1.0															
SR3	.72	.76	1.0														
SR4	.79	.81	.73	1.0													
SR5	.41	.44	.36	.33	1.0												
SR6	.78	.81	.74	.90	.39	1.0											
SR7	.76	.79	.69	.71	.48	.74	1.0										
SR8	.73	.80	.70	.76	.40	.75	.76	1.0									
SR9	.54	.56	.49	.54	.48	.53	.60	.61	1.0								
SR10	.77	.81	.76	.83	.27	.86	.71	.69	.48	1.0							
SR11	.64	.65	.55	.78	.36	.77	.57	.60	.49	.67	1.0						
SR12	.64	.67	.73	.72	.19	.74	.57	.62	.38	.75	.59	1.0					
SR13	.78	.82	.69	.86	.40	.86	.74	.79	.59	.81	.79	.68	1.0				
SR14	.52	.54	.47	.51	.64	.52	.58	.52	.68	.41	.55	.34	.58	1.0			
SR15	.77	.81	.69	.75	.51	.74	.82	.84	.67	.69	.62	.56	.79	.70	1.0		
SR16	.63	.65	.49	.59	.64	.61	.66	.60	.65	.53	.64	.37	.72	.64	.70	1.0	
SR17	.66	.67	.71	.64	.26	.66	.65	.61	.41	.70	.52	.68	.62	.35	.59	.45	
SR18	.71	.76	.61	.61	.72	.64	.73	.68	.58	.57	.54	.48	.67	.65	.77	.75	
SR19	.61	.65	.59	.58	.56	.59	.70	.66	.68	.54	.50	.45	.68	.69	.74	.74	
SR20	.74	.70	.61	.62	.38	.63	.67	.68	.55	.59	.53	.54	.64	.47	.69	.53	
SR21	.60	.66	.62	.72	.18	.73	.57	.72	.42	.68	.59	.69	.68	.40	.63	.36	
SR22	.61	.68	.62	.72	.22	.71	.59	.73	.41	.67	.60	.67	.69	.41	.65	.41	
SR23	.70	.77	.68	.76	.40	.74	.70	.76	.53	.69	.68	.63	.74	.60	.78	.57	
SR24	.67	.72	.64	.74	.37	.73	.70	.73	.53	.67	.64	.60	.71	.61	.78	.54	
SR25	.46	.51	.41	.41	.86	.44	.53	.48	.51	.34	.42	.27	.46	.71	.61	.62	
SR26	.50	.54	.46	.44	.54	.46	.66	.54	.61	.44	.35	.27	.57	.61	.67	.69	
SR27	.52	.57	.46	.51	.40	.53	.62	.59	.51	.52	.37	.36	.66	.44	.62	.64	
SR28	.50	.54	.45	.47	.58	.49	.63	.57	.66	.45	.43	.29	.59	.56	.63	.76	
SR29	.57	.63	.56	.56	.46	.56	.63	.68	.82	.53	.49	.46	.60	.65	.72	.60	
SR30	.61	.66	.52	.64	.50	.64	.66	.65	.62	.59	.63	.43	.73	.57	.73	.80	
SR31	.57	.65	.52	.60	.48	.61	.66	.72	.63	.56	.56	.42	.70	.51	.68	.75	
SR32	.72	.80	.65	.72	.44	.71	.73	.81	.61	.68	.61	.57	.79	.56	.81	.69	
SR33	.01	.05	.04	.10	.10	.10	.03	.24	.19	.02	.13	.05	.15	.00	.06	.19	
SR34	.11	.15	.24	.07	.20	.03	.21	.33	.27	-.01	-.06	.09	.02	.27	.32	.05	
SR35	-.05	.01	.02	.01	-.14	-.03	-.01	.30	-.03	-.10	-.09	.07	-.03	-.13	.06	-.22	
SR36	.39	.41	.32	.46	.17	.45	.39	.42	.27	.37	.41	.32	.50	.38	.46	.34	
SR37	.24	.30	.31	.30	.13	.25	.32	.56	.28	.18	.14	.24	.27	.22	.45	.13	
SR38	.67	.69	.56	.66	.31	.67	.65	.67	.46	.64	.57	.53	.70	.48	.69	.50	
SR39	.22	.23	.19	.28	.12	.27	.25	.24	.16	.21	.24	.18	.31	.27	.30	.21	
SR40	.68	.70	.61	.77	.30	.76	.64	.66	.47	.70	.67	.60	.79	.53	.70	.57	
SR41	.85	.86	.76	.83	.32	.84	.74	.75	.50	.90	.66	.73	.83	.45	.74	.56	
SR42	.73	.76	.68	.80	.31	.80	.69	.72	.48	.79	.66	.66	.82	.50	.74	.57	
SR43	.19	.23	.20	.24	.21	.24	.29	.33	.24	.13	.21	.14	.25	.30	.36	.22	
SR44	.61	.62	.64	.56	.56	.56	.63	.58	.59	.50	.47	.49	.57	.69	.68	.56	
SR45	.56	.59	.56	.59	.31	.56	.55	.67	.44	.48	.43	.48	.56	.41	.62	.40	
SR46	.54	.58	.56	.60	.29	.56	.58	.74	.46	.49	.41	.46	.56	.40	.68	.39	
SR47	.33	.35	.36	.32	.30	.32	.34	.36	.55	.28	.32	.30	.33	.49	.41	.32	

Table 6 (continued)
Inter-Correlations of IDEA Student Ratings (SR) – Diagnostic Form

	SR25	SR26	SR27	SR28	SR29	SR30	SR31	SR32	SR33	SR34	SR35	SR36	SR37	SR38	SR39

SR25	1.0														
SR26	.58	1.0													
SR27	.46	.79	1.0												
SR38	.59	.84	.71	1.0											
SR29	.59	.62	.53	.68	1.0										
SR30	.60	.68	.69	.74	.68	1.0									
SR31	.53	.67	.64	.78	.71	.80	1.0								
SR32	.57	.63	.65	.65	.76	.79	.81	1.0							
SR33	.06	.06	.15	.26	.19	.20	.33	.17	1.0						
SR34	.26	.26	.09	.18	.36	.09	.17	.24	.17	1.0					
SR35	-.09	-.17	-.07	-.14	.08	-.12	.06	.11	.40	.49	1.0				
SR36	.30	.33	.35	.26	.33	.41	.32	.50	.04	.12	.06	1.0			
SR37	.25	.25	.23	.23	.41	.25	.34	.45	.33	.68	.67	.41	1.0		
SR38	.43	.44	.46	.43	.54	.56	.53	.67	.05	.15	.11	.58	.38	1.0	
SR39	.24	.24	.24	.16	.23	.28	.18	.34	.04	.13	.05	.79	.34	.27	1.0
SR40	.43	.49	.54	.47	.54	.64	.57	.74	.07	.09	-.02	.74	.37	.70	.55
SR41	.40	.47	.54	.47	.56	.60	.59	.73	.02	.06	-.03	.41	.25	.73	.22
SR42	.43	.52	.57	.50	.56	.65	.60	.76	.04	.09	-.02	.69	.37	.72	.50
SR43	.28	.26	.25	.25	.31	.28	.26	.32	.14	.30	.24	.33	.43	.35	.29
SR44	.61	.59	.47	.57	.62	.54	.51	.60	.03	.40	-.07	.34	.30	.50	.24
SR45	.38	.38	.40	.40	.49	.45	.48	.60	.21	.37	.27	.42	.54	.51	.27
SR46	.37	.41	.42	.42	.52	.46	.52	.61	.25	.47	.39	.38	.66	.52	.25
SR47	.37	.32	.23	.28	.53	.30	.29	.37	.09	.28	.04	.22	.22	.30	.17

See Table 3 for item descriptions.

Of special interest is the relationship between ratings of teaching methods and instructional outcomes. Are some teaching approaches more closely associated with progress of a given type than others? Do the most effective methods differ depending on instructor objectives? Answers to these questions are highly relevant to the IDEA system's goal of facilitating instructional improvement.

Although a review of relevant correlations in Tables 4, 5, and 6 provides a direct approach to this problem, it is commonly assumed that answers may depend, in part, on class size. Therefore, correlations between instructional methods and student ratings of progress were computed separately for four class sizes—small (10-14), medium (15-34), large (35-49), and very large (50+). Table 7 shows the "methods" items, which were most closely related to progress ratings on each objective for each of these four class sizes. Typically, seven to ten methods were identified as "most" closely related to progress ratings.

Although there was some overlap between the lists of "most relevant" items (especially between the first two objectives), the pattern of items tended to be distinctive for each objective. Differences among class sizes were not dramatic, but were large enough to merit a separate listing of "most relevant items" for each size group.

Table 7
Relationship of Teaching Methods to Learning Objectives (Correlations)

	Obj. 21. Gaining Factual Knowledge				Obj. 22. Principles and Theories				Obj. 23. Applications			
	S	M	L	VL	S	M	L	VL	S	M	L	VL
1. Displayed psnl interest in Ss									.69	.71		
2. Helped Ss answ own Qs	.65	.69	.69	.66	.68	.71	.73	.75	.75	.78	.77	.75
3. Scheduled work helpfully	.64								.69			
4. Demonstrated imp of subject	.70	.73	.74	.73	.69	.72	.72	.73	.76	.79	.78	.76
5. Formed teams, discussion												
6. Made clear how topics fit	.71	.74	.75	.72	.70	.73	.73	.73	.75	.78	.76	.75
7. Explained criticisms										.71	.73	.73
8. Stimulated intellectual effort	.73	.76	.78	.78	.74	.77	.78	.79	.73	.78	.79	.78
9. Encrgd multiple resources												
10. Explained clearly	.67	.70	.72	.70	.67	.69	.70	.71	.69	.71	.70	
11. Related to real life	.64								.69	.70		.68
12. Tests cover imprt. points	.68	.69	.70	.69	.65	.68	.68	.74				
13. Introduce stimulating ideas	.67	.71	.70	.68	.67	.71	.69	.70	.74	.77	.74	.71
14. Involved Ss in "hands on"												
15. Inspired to set high goals	.65	.66	.69	.65	.66	.68	.69	.71	.76	.79	.80	.80
16. Asked to share experiences												
17. Provided timely feedback												
18. Asked Ss to help each other												
19. Creative assessments												
20. Enrgd out class S/F contact												

	Obj. 24. Prof. Skills, Viewpoints				Obj. 25. Team Skills				Obj. 26. Creative Capacities			
	S	M	L	VL	S	M	L	VL	S	M	L	VL
1. Displayed psnl interest in Ss	.67	.70							.54			
2. Helped Ss answ own Qs	.72	.76	.75	.74	.53	.52		.57	.53	.57	.63	.60
3. Scheduled work helpfully												
4. Demonstrated imp of subject	.75	.79	.79	.73								
5. Formed teams, discussion					.75	.77	.77	.70				.62
6. Made clear how topics fit	.75	.79	.78	.71	.52							
7. Explained criticisms	.68	.72	.73	.73	.54		.54	.62	.63	.67	.73	.69

8. Stimulated intellectual effort	.71	.76	.78	.77		.52	.53		.53	.56		
9. Encrgd multiple resources												
10. Explained clearly	.69	.71	.70									
11. Related to real life		.69										
12. Tests cover imprt. points												
13. Introduce stimulating ideas	.73	.77	.75	.69					.57	.58	.65	.60
14. Involved Ss in "hands on"					.67	.67	.68	.72	.52		.63	.72
15. Inspired to set high goals	.76	.78	.80	.79	.60	.59	.61	.70	.68	.66	.73	.78
16. Asked to share experiences						.53			.53	.59	.65	.73
17. Provided timely feedback												
18. Asked Ss to help each other				.68	.63	.67	.65	.70	.55	.57	.69	.79
19. Creative assessments						.53	.56	.63	.74	.78	.73	.64
20. Enrgd out class S/F contact												

S=small (10-14), M=medium (15-34), L=large (35-49), VL=very large (50+)
Only the most highly correlated items are shown.
Note: Analyses reported in Table 7 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

Table 7 (continued)
Relationship of Teaching Methods to Learning Objectives (Correlations)

	Obj. 27. Broad Liberal Education				Obj. 28. Communi-cation Skills				29. Find, Use Resources			
	S	M	L	VL	S	M	L	VL	S	M	L	VL
1. Displayed psnl interest in Ss	.50					.55						
2. Helped Ss answ own Qs	.51	.59	.56	.52	.56	.58	.58	.59	.64	.65	.66	.64
3. Scheduled work helpfully												
4. Demonstrated imp of subject			.57	.52								
5. Formed teams, discussion												
6. Made clear how topics fit	.50	.58	.58	.54								
7. Explained criticisms	.56	.62	.62	.57	.62	.65	.62	.66	.63	.65	.67	.67
8. Stimulated intellectual effort	.50	.60	.59		.59	.59	.61	.55	.70	.72	.67	.66
9. Encrgd multiple resources									.77	.82	.85	.85
10. Explained clearly		.58	.60	.51								
11. Related to real life												
12. Tests cover imprt. points												
13. Introduce stimulating ideas	.57	.67	.67	.59	.56	.56	.61	.56	.62	.63		
14. Involved Ss in "hands on"									.63	.64	.69	.73
15. Inspired to set high goals	.53	.59	.57	.56	.63	.62	.64	.60	.72	.73	.74	.77
16. Asked to share experiences		.57	.60	.59	.66	.68	.72	.60				.63
17. Provided timely feedback												
18. Asked Ss to help each other					.58	.60	.62		.63	.63	.65	.71
19. Creative assessments	.52	.61	.63	.50	.72	.76	.78	.77	.66	.68	.65	.74
20. Enrgd out class S/F contact										.63	.64	

	Obj. 30. Values Development.				Obj. 31. Critical Analysis				Obj. 32. Interest in Learning			
	S	M	L	VL	S	M	L	VL	S	M	L	VL
1. Displayed psnl interest in Ss	.61		.69	.63					.70	.72	.74	.76
2. Helped Ss answ own Qs	.66	.72	.73	.65	.68	.71	.72	.72	.79	.81	.83	.85
3. Scheduled work helpfully												
4. Demonstrated imp of subject	.62	.70	.75	.67			.65	.63	.71	.72	.75	.74
5. Formed teams, discussion												
6. Made clear how topics fit	.61	.69	.73	.65				.64	.70	.72	.74	
7. Explained criticisms					.65	.68	.66	.67	.70	.73	.77	.79
8. Stimulated intellectual effort	.65	.69			.72	.75	.74	.68	.78	.83	.85	.82

9. Encrgd multiple resources													
10. Explained clearly			.68							.70			
11. Related to real life	.64	.71	.67										
12. Tests cover imprt. points													
13. Introduce stimulating ideas	.70	.77	.78	.69		.69	.71	.73	.71		.77	.81	.82	.78
14. Involved Ss in "hands on"													
15. Inspired to set high goals	.66	.71	.69	.61		.68	.69	.67	.64		.78	.80	.81	.81
16. Asked to share experiences	.74	.75	.75	.70		.70	.72	.74	.75				.75	
17. Provided timely feedback														
18. Asked Ss to help each other	.66	.69				.64	.66		.64		.72	.74	.75	.76
19. Creative assessments						.70	.71	.73	.73				.73	
20. Enrgd out class S/F contact														

S=small (10-14), M=medium (15-34), L=large (35-49), VL=very large (50+)
Only the most highly correlated items are shown.
Note: Analyses reported in Table 7 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

Class size is relevant in another way. Average ratings of the frequency with which each method is employed varies with the size of the class. These ratings also vary with the degree to which students were motivated (really wanted the course regardless of who taught it). Faculty members participating in the program want to know if their ratings were above or below average, especially on those items shown to be most related to progress on objectives they have chosen.

To obtain a meaningful answer to this question, it is necessary to know the average rating for each item for classes grouped according to both class size and student motivation. Accordingly, four class sizes were identified: Small (10-14), Medium (15-34), Large (35-49), and Very Large (50 or more). Similarly, five "motivation" levels were established, representing roughly the upper 10 percent (High), the next 20 percent (High Average), the middle 40 percent (Average), the next 20 percent (Low Average), and the lowest 10 percent (Low). By jointly considering these two classification methods, a 4 x 5 table was constructed consisting of 20 cells (one for each combination of class size and student motivation). Average scores on each of the 20 teaching methods items were then computed for each item. Results are shown below in Table 8.

Table 8
Average Scores for Method Items by Class Size and Level of Student Motivation

1. Displayed a personal interest in students and their learning

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	4.29	4.18	4.10	3.98
	Low Average	4.38	4.29	4.17	4.13
	Average	4.45	4.38	4.29	4.22
	High Average	4.55	4.45	4.42	4.23
	High	4.61	4.53	4.44	4.44

2. Found ways to help students answer their own questions

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	4.03	3.90	3.83	3.67
	Low Average	4.12	4.04	3.93	3.83
	Average	4.20	4.14	4.04	3.95
	High Average	4.29	4.21	4.17	3.97
	High	4.36	4.31	4.22	4.24

3. Scheduled course work (class activities, tests, projects) in ways which encouraged students to stay up-to-date in their work

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	4.11	4.07	3.97	3.86
	Low Average	4.21	4.16	4.08	4.02
	Average	4.25	4.24	4.16	4.09
	High Average	4.35	4.29	4.24	4.13
	High	4.39	4.34	4.23	4.21

4. Demonstrated the importance and significance of subject matter

Student		Class Size (Enrollment)			

Motivation (#39)		Small	Medium	Large	Very Large
	Low	4.19	4.09	4.09	4.03
	Low Average	4.30	4.24	4.21	4.18
	Average	4.39	4.37	4.35	4.30
	High Average	4.50	4.45	4.47	4.38
	High	4.57	4.54	. 4.51	4.53

5. Formed teams or discussion groups to facilitate learning

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.42	3.50	3.12	2.85
	Low Average	3.60	3.58	3.24	2.90
	Average	3.66	3.68	3.38	3.18
	High Average	3.75	3.72	3.58	3.51
	High	3.86	3.84	3.66	3.55

6. Made it clear how each topic fit into the course

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	4.04	3.95	3.95	3.90
	Low Average	4.18	4.12	4.10	4.05
	Average	4.27	4.25	4.23	4.17
	High Average	4.39	4.34	4.38	4.25
	High	4.46	4.43	4.40	4.42

7. Explained the reasons for criticisms of students' academic performance

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.72	3.61	3.42	3.31
	Low Average	3.83	3.73	3.54	3.46
	Average	3.91	3.84	3.68	3.54
	High Average	4.02	3.92	3.84	3.62
	High	4.13	4.08	3.92	3.98

8. Stimulated students to intellectual effort beyond that required by most classes

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.82	3.64	3.52	3.43
	Low Average	3.93	3.78	3.70	3.63
	Average	4.00	3.91	3.83	3.75
	High Average	4.10	3.98	4.00	3.90
	High	4.16	4.10	4.11	4.17

9. Encouraged students to use multiple resources...to improve understanding

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.77	3.66	3.39	3.12
	Low Average	3.88	3.74	3.46	3.31

	Average	3.93	3.84	3.67	3.40
	High Average	4.00	3.89	3.84	3.61
	High	4.05	3.98	3.88	3.97

10. Explained course material clearly and concisely

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.93	3.89	3.84	3.80
	Low Average	4.07	4.05	3.99	3.97
	Average	4.16	4.16	4.13	4.10
	High Average	4.29	4.23	4.25	4.15
	High	4.37	4.33	4.29	4.30

11. Related course material to real life situations

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	4.03	3.94	4.05	3.86
	Low Average	4.17	4.14	4.16	4.06
	Average	4.30	4.28	4.31	4.28
	High Average	4.41	4.35	4.43	4.36
	High	4.47	4.44	4.45	4.45

12.Gave tests, projects, etc. that covered the most important points of the course

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	4.14	4.08	4.12	4.05
	Low Average	4.23	4.21	4.25	4.20
	Average	4.33	4.31	4.33	4.30
	High Average	4.41	4.36	4.38	4.24
	High	4.43	4.36	4.32	4.23

13. Introduced stimulating ideas about the subject

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.81	3.70	3.72	3.62
	Low Average	4.00	3.92	3.88	3.84
	Average	4.13	4.09	4.07	4.01
	High Average	4.27	4.20	4.23	4.10
	High	4.36	4.32	4.28	4.27

14. Involved students in hands on projects such as research, case studies, or real life activities

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.73	3.52	3.32	3.07
	Low Average	3.87	3.67	3.36	3.12
	Average	4.01	3.88	3.64	3.47
	High Average	4.13	4.03	3.92	3.88
	High	4.28	4.20	4.02	3.86

15. Inspired students to set and achieve goals which really challenged them

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.70	3.52	3.28	3.16
	Low Average	3.83	3.66	3.47	3.33
	Average	3.92	3.82	3.64	3.52
	High Average	4.06	3.95	3.86	3.75
	High	4.21	4.14	4.03	4.07

16. Asked students to share ideas and experiences with others whose backgrounds and viewpoints differ from their own

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.57	3.47	3.25	2.94
	Low Average	3.78	3.64	3.42	3.15
	Average	3.84	3.79	3.60	3.32
	High Average	3.96	3.87	3.76	3.46
	High	4.07	3.98	3.83	3.93

17. Provided timely and frequent feedback on tests, reports, projects, etc. to help students improve

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	4.00	3.93	3.89	3.69
	Low Average	4.13	4.07	3.98	3.84
	Average	4.18	4.14	4.08	3.95
	High Average	4.26	4.19	4.16	3.89
	High	4.32	4.25	4.20	4.14

18. Asked students to help each other understand ideas and concepts

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.71	3.63	3.42	3.23
	Low Average	3.86	3.74	3.53	3.38
	Average	3.93	3.87	3.66	3.53
	High Average	4.03	3.95	3.85	3.69
	High	4.14	4.09	3.93	3.97

19. Gave projects, tests, or assignments that required original or creative thinking

Student Motivation (#39)		Class Size (Enrollment)			
		Small	Medium	Large	Very Large
	Low	3.83	3.75	3.47	3.21
	Low Average	4.00	3.89	3.60	3.39
	Average	4.07	4.01	3.78	3.54
	High Average	4.17	4.07	3.89	3.67
	High	4.24	4.13	3.94	3.83

20. Encouraged student-faculty interaction outside of class (office visits, phone calls, email, etc.)

Student		Class Size (Enrollment)

		Small	Medium	Large	Very Large
Motivation (#39)	Low	3.86	3.74	3.64	3.55
	Low Average	3.96	3.87	3.77	3.77
	Average	4.03	3.96	3.90	3.83
	High Average	4.09	3.98	4.03	3.78
	High	4.14	4.05	4.07	4.15

Note: Analyses reported in Table 8 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

The information provided in these cells is intended to provide diagnostic assistance to those using the Diagnostic Form (see pages 4 and 5 of the sample IDEA Report included in Appendix A). This is done through a series of steps.

First, "relevant" objectives are identified (those the instructor identified as "Important" or "Essential"). Then, the most relevant teaching methods—those most closely related to a given progress rating—are identified (see Table 7). The class is then classified according by its size and level of student motivation. Results on the "most relevant" items are then compared with those for "similar classes" using the data reported above.

If the obtained mean is 0.3 (approximately one standard error) or more above the mean for similar classes, the user is encouraged to retain this approach; if it is 0.3 or more below the mean for similar classes, the user is advised to "consider increasing the frequency" with which the method is employed.

Table 9 provides normative information for each of the items included on the Diagnostic Form. Separate norms for the Short Form are not included for reasons described in Section VI of this report. Norms are provided for all institutions and for those whose highest degree offered is the Associate (2-year), Baccalaureate, Master's, or Doctoral. As noted earlier, a number of "Other" institutions also participated. These were principally institutions with highly specialized emphases; they were so heterogeneous that a meaningful norm (comparison) group could not be described.

For items or measures that are intended to provide information about the effectiveness of instruction, norms are provided for both *unadjusted (raw)* and *adjusted* scores. Of these, Items 21-32 represent student ratings of the progress they made on each of 12 learning objectives; for these 12 items, the only classes included are those for which the objective was rated as "Essential" or "Important" by the instructor. The process of adjusting scores is described in Section III of this report.

Table 9 also provides norms for five "scales" descriptive of alternative teaching approaches or styles contained in the IDEA Survey. A further description of these scales is provided in Section II of this report.

As shown in Table 9, for the most part, differences among types of institutions were relatively slight. There appeared to be a tendency for ratings to be slightly higher at two-year institutions. For example, on Item 17 (frequency and timeliness of feedback) an average of 4.3 was at the 49th percentile for 2-year colleges but at the 61st percentile for those offering the baccalaureate degree. Similarly, on Item 47 (use of educational technology), an average rating of 3.7 was equivalent to the 46th percentile for 2-year colleges but the 57th percentile for 4-year colleges. But there were numerous exceptions The average ratings for the four types of institutions, given at the bottom of each table, were very close to each other.

Differences among types of institutions were so slight that the IDEA Center will continue to use the all-classes norm in its reports. Users who feel more comfortable in interpreting results if they are compared

with those from similarly classified institutions will find the necessary information in the Table 9 below.

Table 9
Percentile Ranks for IDEA Diagnostic Form Items and Scales
By Type of Institution

1. Displayed personal interest answer own questions

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	0	0	0
2.8	1	1	1	1	1
3.0	2	1	1	1	2
3.3	4	3	3	4	5
3.5	6	5	6	6	8
3.7	11	9	10	10	13
3.9	17	15	16	17	20
4.1	26	23	25	26	28
4.3	38	35	37	38	41
4.5	54	52	54	55	56
4.7	74	73	73	75	74
4.9	92	92	92	93	92
5.0	98	98	98	98	97
Avg.	4.3	4.4	4.3	4.3	4.3

2. Helped students

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	1	0	1
2.8	2	1	2	2	2
3.0	3	2	4	3	4
3.3	7	5	8	8	9
3.5	12	9	13	13	15
3.7	19	15	20	21	22
3.9	30	25	32	32	33
4.1	43	37	46	46	46
4.3	59	53	62	62	61
4.5	76	73	80	79	77
4.7	90	89	92	91	90
4.9	98	97	98	98	98
5.0	99	99	99	99	99
Avg.	4.1	4.2	4.1	4.1	4.1

3. Scheduled work helpfully

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	0	0	0
2.8	1	1	1	1	1
3.0	2	1	2	2	2
3.3	5	3	5	5	6
3.5	8	6	9	9	10
3.7	14	10	15	15	16
3.9	22	18	24	24	26
4.1	35	29	37	37	39
4.3	51	45	53	54	54
4.5	70	65	73	73	72
4.7	87	85	89	89	88
4.9	97	97	98	98	97
5.0	99	99	99	99	99
Avg.	4.2	4.3	4.2	4.2	4.2

4. Demonstrated significance

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	0	0	0
2.8	0	0	0	0	0
3.0	1	1	1	1	1
3.3	3	2	3	3	4
3.5	5	4	6	5	7
3.7	9	7	10	9	12
3.9	16	14	17	16	20
4.1	26	23	27	26	30
4.3	40	37	42	41	44
4.5	59	57	60	60	61
4.7	78	78	80	80	79
4.9	94	94	95	95	94
5.0	98	98	99	99	98
Avg.	4.3	4.4	4.3	4.3	4.3

5. Formed "teams"

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	2	2	3	3	3
2.0	10	9	11	11	10
2.5	20	20	21	22	18
2.8	27	28	29	28	24
3.0	31	33	34	32	27
3.3	38	40	41	39	33
3.5	43	47	46	44	38
3.7	49	53	52	49	43
3.9	55	59	58	56	49
4.1	62	66	65	62	56

6. Made clear how topics fit

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	0	0	0
2.8	1	1	1	1	2
3.0	2	2	2	2	3
3.3	5	5	5	5	7
3.5	9	9	8	9	11
3.7	15	14	14	14	18
3.9	23	23	22	23	27
4.1	34	34	32	34	39

4.3	70	74	73	70	65
4.5	79	82	81	79	75
4.7	88	91	90	87	86
4.9	96	97	97	96	96
5.0	99	99	99	99	99
Avg.	3.5	3.5	3.4	3.5	3.6

4.3	50	49	48	50	53
4.5	68	68	67	69	70
4.7	85	85	86	87	86
4.9	97	97	97	97	96
5.0	99	99	99	99	99
Avg.	4.2	4.2	4.2	4.2	4.2

7. Explained criticisms

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	2	2	2	2	3
2.8	5	5	4	5	6
3.0	9	8	8	9	11
3.3	18	17	16	20	22
3.5	28	27	26	31	31
3.7	40	38	38	44	43
3.9	55	52	52	59	56
4.1	68	66	67	72	68
4.3	80	79	80	84	80
4.5	90	89	90	92	90
4.7	96	96	96	97	96
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.8	3.8	3.8	3.7	3.8

8. Stimulated intellectual effort

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	2	1	3	1	2
2.8	4	3	7	4	5
3.0	7	6	11	7	9
3.3	15	12	20	16	18
3.5	24	20	29	25	27
3.7	35	30	42	37	37
3.9	48	44	56	50	50
4.1	62	57	68	64	63
4.3	75	73	79	77	76
4.5	87	86	89	88	87
4.7	95	94	96	95	95
4.9	99	98	99	99	99
5.0	99	99	99	99	99
Avg.	3.9	3.9	3.8	3.8	3.8

9. Encouraged using multiple resources clearly

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	1	0	2	1	1
2.5	5	3	7	6	5
2.8	9	6	13	12	10
3.0	14	10	19	17	15
3.3	23	18	29	27	24
3.5	31	26	37	36	32
3.7	40	36	46	45	41
3.9	51	47	57	55	51
4.1	61	58	68	66	60
4.3	73	71	80	76	72
4.5	84	83	89	86	83
4.7	93	92	95	94	92
4.9	98	98	98	98	98
5.0	99	99	99	99	99
Avg.	3.8	3.9	3.7	3.7	3.8

10. Explained clearly

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	2	1	2	2	2
2.8	4	2	4	4	5
3.0	5	3	6	6	7
3.3	10	7	11	11	12
3.5	14	10	15	16	17
3.7	20	15	21	22	24
3.9	28	22	29	31	33
4.1	38	31	40	41	43
4.3	52	43	55	55	56
4.5	68	60	72	71	72
4.7	84	80	88	87	85
4.9	96	95	98	97	96
5.0	99	98	99	99	99
Avg.	4.1	4.2	4.1	4.1	4.1

11. Related to real life

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	1	1	1	1	1
2.8	2	2	3	2	2

12. Tests covered important points

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	0	0	0
2.8	1	1	1	1	1

3.0	4	4	4	3	4
3.3	8	8	9	7	9
3.5	12	13	14	11	13
3.7	18	19	20	17	19
3.9	25	27	29	24	27
4.1	34	36	39	33	36
4.3	46	49	51	45	48
4.5	61	63	64	60	62
4.7	77	79	78	77	77
4.9	93	94	93	93	93
5.0	98	98	98	98	98
Avg.	4.2	4.2	4.2	4.2	4.2

3.0	2	1	2	2	2
3.3	4	3	5	4	5
3.5	7	5	8	7	9
3.7	11	9	13	11	15
3.9	19	15	21	19	24
4.1	28	23	31	29	35
4.3	42	36	46	43	49
4.5	60	53	65	62	67
4.7	80	75	84	82	84
4.9	95	94	97	96	96
5.0	99	98	99	99	99
Avg.	4.3	4.4	4.2	4.3	4.2

13. Introduced stimulating ideas

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	1	1	1	1	2
2.8	3	3	4	3	4
3.0	5	5	6	5	7
3.3	11	10	12	11	14
3.5	17	15	18	17	20
3.7	25	22	26	26	28
3.9	35	33	37	37	39
4.1	48	45	50	50	50
4.3	62	60	64	64	63
4.5	77	76	9	79	76
4.7	89	89	91	90	88
4.9	97	97	98	98	97
5.0	99	99	99	99	99
Avg.	4.0	4.1	4.0	4.0	4.0

14. Involved in "hands on"

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	3	2	2	3	3
2.5	8	8	7	10	9
2.8	13	13	12	14	14
3.0	18	18	16	19	18
3.3	25	27	24	27	25
3.5	32	34	32	33	32
3.7	40	42	40	41	39
3.9	49	52	50	50	47
4.1	59	62	60	60	56
4.3	69	73	71	70	66
4.5	80	84	81	81	78
4.7	90	92	91	90	88
4.9	97	98	97	97	97
5.0	99	99	99	99	99
Avg.	3.7	3.7	3.8	3.7	3.8

15. Inspired ambitious goals students to share ideas

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	3	2	3	3	3
2.8	7	6	7	7	8
3.0	12	10	11	12	14
3.3	22	18	23	24	24
3.5	31	27	33	35	34
3.7	42	38	45	47	44
3.9	55	51	57	60	56
4.1	67	63	69	72	67
4.3	79	76	80	82	79
4.5	88	87	90	90	88
4.7	95	94	96	96	95
4.9	99	98	99	99	98
5.0	99	99	99	99	99
Avg.	3.7	3.8	3.7	3.7	3.7

16. Asked diverse

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	2	2	3	3	3
2.5	9	7	10	11	10
2.8	15	13	16	18	15
3.0	20	18	22	24	20
3.3	29	27	31	33	28
3.5	36	35	39	40	34
3.7	44	43	48	49	42
3.9	54	54	58	57	50
4.1	63	64	68	66	60
4.3	74	75	78	76	70
4.5	84	85	87	85	80
4.7	92	93	94	93	90
4.9	98	98	99	98	97
5.0	99	99	99	99	99
Avg.	3.7	3.7	3.6	3.6	3.7

17. Timely feedback

18. Asked

students to help others

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	1	0	2	2	2
2.8	3	2	4	4	4
3.0	5	3	7	6	7
3.3	10	6	12	11	12
3.5	14	10	17	16	18
3.7	21	16	24	22	25
3.9	29	24	35	31	35
4.1	40	34	46	41	46
4.3	54	49	61	56	60
4.5	71	67	77	73	74
4.7	86	84	90	87	87
4.9	97	96	98	97	97
5.0	99	99	99	99	99
Avg.	4.1	4.2	4.0	4.1	4.0

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	3	3	2	3	4
2.8	8	7	7	8	8
3.0	12	11	11	13	13
3.3	21	20	21	23	22
3.5	30	28	31	32	30
3.7	40	38	42	43	40
3.9	52	50	55	55	51
4.1	64	62	68	67	63
4.3	76	74	80	78	75
4.5	87	86	91	88	86
4.7	94	94	97	95	94
4.9	98	98	99	99	98
5.0	99	99	99	99	99
Avg.	3.8	3.8	3.8	3.7	3.8

19. Required originality

out-of-class contact

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	3	2	3	3	3
2.8	6	5	7	7	7
3.0	10	8	11	11	10
3.3	17	15	18	20	18
3.5	24	22	25	27	25
3.7	32	30	33	35	33
3.9	43	41	44	46	42
4.1	54	53	55	58	52
4.3	67	66	67	70	64
4.5	80	80	80	82	77
4.7	90	91	90	91	89
4.9	97	98	97	98	97
5.0	99	99	99	99	99
Avg.	3.9	4.0	3.9	3.9	3.9

20. Encouraged

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	2	3	4	2	2
2.8	5	7	7	4	5
3.0	9	11	12	7	9
3.3	16	19	21	14	16
3.5	24	27	30	21	24
3.7	33	37	39	30	33
3.9	44	49	51	42	44
4.1	56	61	62	54	56
4.3	69	73	74	68	68
4.5	82	85	85	81	81
4.7	92	93	93	92	91
4.9	98	98	98	98	98
5.0	99	99	99	99	99
Avg.	3.9	3.8	3.8	3.9	3.9

21. Factual knowledge (unadjusted)
knowledge (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	1	0	0
2.8	2	1	3	1	2
3.0	3	3	5	3	4
3.3	8	7	12	8	9
3.5	15	12	19	15	16
3.7	24	20	29	25	25
3.9	37	34	43	39	39
4.1	53	49	57	55	54
4.3	70	68	73	71	70
4.5	85	84	86	86	85
4.7	94	94	95	95	95
4.9	99	99	99	99	99
5.0	99	99	99	99	99

21. Factual

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	1	1	2	1	1
2.8	3	2	5	3	3
3.0	5	4	8	5	6
3.3	11	9	16	11	12
3.5	18	16	24	18	20
3.7	28	26	36	28	29
3.9	42	40	48	42	43
4.1	58	57	63	58	59
4.3	74	74	77	73	74
4.5	87	87	90	87	87
4.7	95	95	96	95	95
4.9	98	98	98	98	98
5.0	99	99	99	99	99

Avg.	4.0	4.0	3.9	4.0	4.0

Avg.	4.0	4.0	3.9	4.0	4.0

22. Principles, theories (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	1	0	0
2.8	2	1	3	2	2
3.0	4	3	6	4	4
3.3	10	7	14	10	10
3.5	17	13	22	17	18
3.7	27	23	33	27	28
3.9	42	38	47	42	43
4.1	58	55	63	59	58
4.3	75	73	78	76	74
4.5	89	88	89	90	88
4.7	96	96	96	97	96
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.9	4.0	3.9	3.9	3.9

22. Principles, theories (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	1	1	2	1	1
2.8	3	2	6	3	3
3.0	5	4	9	5	6
3.3	12	10	19	12	13
3.5	20	17	27	20	22
3.7	32	28	39	31	33
3.9	47	44	53	46	47
4.1	63	61	69	62	63
4.3	79	78	82	79	78
4.5	90	90	91	90	89
4.7	96	96	97	96	96
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.9	4.0	3.8	3.9	3.9

23. Applications (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	1	0	0
2.8	2	1	3	2	2
3.0	4	3	5	4	5
3.3	10	7	11	10	11
3.5	16	13	20	17	18
3.7	26	23	30	27	28
3.9	39	36	44	40	40
4.1	54	52	57	55	54
4.3	69	69	71	71	69
4.5	84	84	85	85	83
4.7	93	94	94	94	93
4.9	98	98	98	99	98
5.0	99	99	99	99	99
Avg.	4.0	4.0	3.9	4.0	4.0

23. Applications (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	1	1	2	1	1
2.8	3	2	5	3	4
3.0	6	4	8	6	6
3.3	12	11	17	13	14
3.5	20	18	26	20	22
3.7	31	29	36	30	32
3.9	44	44	49	44	45
4.1	59	61	64	59	59
4.3	74	76	77	73	73
4.5	86	88	88	85	85
4.7	94	95	95	94	93
4.9	98	98	98	98	97
5.0	99	99	99	99	98
Avg.	4.0	4.0	3.9	4.0	4.0

24. Professional skills, attitudes (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	1	0	0
2.8	2	2	2	2	2
3.0	4	3	4	4	4
3.3	9	8	10	9	11
3.5	15	14	16	15	18
3.7	23	22	25	24	27
3.9	35	33	37	36	39
4.1	48	47	49	50	52

24. Professional skills, attitudes (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	1	1	2	1	1
2.8	3	3	4	3	3
3.0	5	5	7	5	6
3.3	11	11	14	11	13
3.5	18	19	21	18	20
3.7	28	29	31	27	30
3.9	41	44	43	39	43
4.1	56	60	57	53	57

4.3	64	63	65	66	67
4.5	80	80	79	81	81
4.7	91	91	91	92	92
4.9	98	98	97	98	98
5.0	99	99	99	99	99
Avg.	4.0	4.1	4.0	4.0	4.0

4.3	71	75	71	68	71
4.5	84	87	84	82	83
4.7	92	94	93	92	92
4.9	97	98	97	97	97
5.0	98	99	98	98	98
Avg.	4.0	4.0	4.0	4.0	4.0

25. Team skills (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	3	3	4	3	2
2.8	6	7	8	5	5
3.0	8	10	11	7	8
3.3	15	17	18	14	15
3.5	21	24	23	21	22
3.7	30	32	31	29	32
3.9	41	44	41	40	44
4.1	54	56	55	53	57
4.3	68	70	69	68	70
4.5	81	83	81	81	83
4.7	92	93	92	92	92
4.9	98	98	98	98	98
5.0	99	99	99	99	99
Avg.	3.9	3.9	3.9	3.9	3.9

(adjusted)

25. Team skills

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	1	1	1	1	1
2.5	4	5	7	3	4
2.8	7	9	11	6	7
3.0	11	12	16	9	11
3.3	19	20	24	17	19
3.5	26	28	30	24	28
3.7	35	38	38	33	38
3.9	47	51	51	45	49
4.1	61	64	65	58	63
4.3	75	78	77	72	77
4.5	86	89	87	85	87
4.7	93	95	94	92	94
4.9	97	98	98	97	98
5.0	98	98	99	98	99
Avg.	3.9	3.8	3.8	3.9	3.9

26. Creative capacities (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	1	0	1	2	2
2.5	4	3	4	6	6
2.8	8	5	8	10	11
3.0	12	8	12	15	15
3.3	19	16	19	23	22
3.5	26	23	26	29	28
3.7	34	33	34	37	36
3.9	45	45	45	46	46
4.1	56	57	56	56	57
4.3	68	70	69	68	69
4.5	81	82	81	80	82
4.7	91	93	91	89	92
4.9	97	98	98	97	98
5.0	99	99	99	99	99
Avg.	3.9	3.9	3.9	3.8	3.8

capacities (adjusted)

26. Creative

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	1	1	2	2	1
2.5	5	3	6	7	7
2.8	9	7	10	12	11
3.0	13	11	15	15	15
3.3	21	18	24	24	23
3.5	29	27	30	32	30
3.7	38	37	39	41	39
3.9	48	49	49	50	50
4.1	60	62	60	60	61
4.3	72	74	72	71	73
4.5	83	85	82	81	83
4.7	91	93	90	89	91
4.9	96	97	96	95	95
5.0	97	98	97	97	96
Avg.	3.9	3.9	3.8	3.8	3.8

27. Broad liberal education (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	1	0	2	2	2
2.5	7	3	8	8	8
2.8	13	7	15	15	15

education (adjusted)

27. Broad liberal

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	1	0	0
2.0	2	1	5	3	3
2.5	8	4	12	8	10
2.8	14	8	18	15	17

3.0	18	11	20	20	20
3.3	28	20	30	30	30
3.5	36	29	40	38	38
3.7	45	39	48	46	47
3.9	56	51	58	56	56
4.1	65	62	67	66	65
4.3	76	75	77	77	75
4.5	86	87	87	86	85
4.7	94	95	95	94	93
4.9	98	99	99	98	98
5.0	99	99	99	99	99
Avg.	3.7	3.8	3.6	3.7	3.7

3.0	20	14	25	20	23
3.3	30	25	37	31	32
3.5	39	34	44	39	41
3.7	49	45	52	48	49
3.9	59	57	61	58	59
4.1	69	68	71	69	69
4.3	79	80	79	78	77
4.5	87	88	87	86	86
4.7	93	94	93	92	93
4.9	97	98	97	96	97
5.0	98	98	98	97	98
Avg.	3.7	3.8	3.6	3.7	3.7

28. Communication skills (unadjusted)
Communication skills (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	1	0	2	1	1
2.5	4	3	6	5	5
2.8	9	7	11	10	9
3.0	13	11	16	14	13
3.3	21	17	27	23	20
3.5	29	25	37	32	28
3.7	39	35	46	42	37
3.9	50	47	56	54	47
4.1	62	59	66	64	59
4.3	75	73	76	77	71
4.5	86	86	86	87	84
4.7	94	95	94	95	93
4.9	99	99	98	99	98
5.0	99	99	99	99	99
Avg.	3.8	3.8	3.7	3.7	3.8

28.

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	1	0	0
2.0	1	1	3	2	2
2.5	5	4	9	5	6
2.8	10	8	14	11	10
3.0	14	11	21	16	14
3.3	24	20	33	27	23
3.5	33	28	42	36	32
3.7	43	38	51	47	41
3.9	54	50	61	57	52
4.1	66	63	70	68	63
4.3	77	75	78	79	74
4.5	86	86	87	87	85
4.7	93	94	93	94	92
4.9	97	97	97	97	97
5.0	98	98	98	98	98
Avg.	3.8	3.9	3.7	3.7	3.8

29. Find, use resources (unadjusted)
resources (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	1	0	0
2.5	2	1	6	2	2
2.8	6	3	13	7	6
3.0	10	7	19	12	11
3.3	22	16	33	24	24
3.5	32	25	45	35	34
3.7	44	38	57	48	45
3.9	58	54	70	62	59
4.1	71	68	81	74	71
4.3	84	82	90	85	83
4.5	92	92	95	93	91
4.7	97	97	98	97	97
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.7	3.8	3.5	3.7	3.7

29. Find, use

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	3	0	0
2.5	3	1	10	3	3
2.8	8	4	19	9	7
3.0	12	8	25	14	13
3.3	24	17	40	27	25
3.5	35	27	52	39	37
3.7	47	40	64	52	48
3.9	61	56	75	65	61
4.1	74	71	85	77	72
4.3	85	85	91	86	84
4.5	92	92	95	93	92
4.7	97	97	97	97	96
4.9	99	99	99	98	99
5.0	99	99	99	99	99
Avg.	3.7	3.8	3.4	3.7	3.7

30. Values development (unadjusted)
development (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0

30. Values

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0

2.0	0	0	1	0	0
2.5	3	2	5	3	4
2.8	7	5	10	7	9
3.0	11	8	15	11	13
3.3	21	16	26	21	22
3.5	30	25	35	30	31
3.7	40	37	45	40	41
3.9	53	51	56	51	53
4.1	65	65	67	63	63
4.3	77	80	79	75	75
4.5	88	90	89	87	87
4.7	95	96	96	94	94
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.8	3.8	3.7	3.8	3.8

2.0	1	0	2	1	1
2.5	4	3	9	4	6
2.8	9	6	15	9	11
3.0	14	10	21	13	16
3.3	24	19	32	24	26
3.5	33	29	41	32	35
3.7	45	42	51	43	46
3.9	57	58	61	55	57
4.1	70	72	69	67	69
4.3	81	84	80	78	80
4.5	89	93	88	86	89
4.7	95	97	94	93	95
4.9	98	98	97	97	98
5.0	99	99	98	98	99
Avg.	3.8	3.8	3.7	3.8	3.7

31. Critical analysis (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	1	0	0
2.5	2	1	4	2	2
2.8	5	3	9	6	6
3.0	9	6	12	10	10
3.3	17	13	20	18	19
3.5	25	20	29	27	28
3.7	35	30	40	37	37
3.9	48	45	53	49	49
4.1	62	59	65	63	61
4.3	76	75	78	76	74
4.5	88	88	89	87	87
4.7	95	95	96	95	95
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.8	3.9	3.8	3.8	3.8

31. Critical analysis (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	2	0	0
2.5	3	1	6	3	3
2.8	7	4	12	7	8
3.0	10	7	16	11	12
3.3	20	15	26	21	23
3.5	28	23	36	29	31
3.7	40	35	47	41	41
3.9	53	50	60	53	53
4.1	67	66	72	66	66
4.3	80	80	81	79	80
4.5	90	91	90	88	89
4.7	95	96	95	94	96
4.9	98	98	98	98	98
5.0	99	99	99	99	99
Avg.	3.8	3.9	3.7	3.8	3.8

32. Interest in learning (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	2	0	3	2	2
2.8	5	3	7	5	6
3.0	9	5	12	10	11
3.3	18	11	23	20	22
3.5	28	19	33	31	32
3.7	40	30	47	42	44
3.9	54	44	61	56	57
4.1	67	60	74	70	69
4.3	80	75	85	82	80
4.5	90	88	94	91	90
4.7	96	96	98	97	96
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.8	3.9	3.7	3.8	3.8

32. Interest in learning (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	1	0	0
2.5	3	1	6	3	2
2.8	6	4	12	7	7
3.0	11	6	17	11	12
3.3	21	14	31	23	24
3.5	31	23	42	33	33
3.7	43	35	54	45	45
3.9	57	50	66	58	58
4.1	71	66	78	72	70
4.3	82	80	88	83	82
4.5	91	90	93	90	90
4.7	96	96	97	96	95
4.9	98	98	99	98	98
5.0	99	99	99	99	99
Avg.	3.8	3.9	3.6	3.8	3.8

Progress on Relevant Objectives (unadjusted)

(PRO ratings are standardized T Scores. The distribution has a mean of 50 and standard deviation of 10.)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
25	0	0	1	0	0
30	2	2	3	2	2
35	5	4	6	5	5
40	11	10	13	12	12
43	18	15	21	18	20
45	24	21	27	24	25
48	34	32	38	36	35
50	43	41	47	44	43
53	57	55	61	59	57
55	67	66	71	69	67
58	81	81	83	82	79
60	88	88	89	89	87
62	93	93	94	94	93
65	98	98	98	98	98
70	99	99	99	99	99
Avg.	50.7	51.3	50.0	50.5	50.8

Progress on Relevant Objectives (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
25	0	0	1	0	0
30	2	1	3	1	2
35	4	4	6	4	5
40	10	9	14	11	11
43	17	15	22	17	18
45	22	21	28	23	23
48	34	33	41	34	34
50	43	42	49	43	43
53	58	58	63	58	57
55	68	68	72	68	67
58	81	82	84	81	80
60	88	89	90	88	87
62	93	94	94	93	92
65	97	97	97	97	97
70	99	99	99	99	99
Avg.	50.9	51.2	49.7	51.1	51.0

33. Amount of reading other work

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	2	1	5	1	1
2.0	6	5	14	6	5
2.5	16	16	28	14	15
2.8	26	26	38	23	25
3.0	35	34	47	32	35
3.3	53	51	60	51	53
3.5	65	64	68	64	66
3.7	75	74	76	74	75
3.9	83	82	82	83	83
4.1	88	88	88	89	89
4.3	93	93	92	93	93
4.5	96	96	95	96	97
4.7	98	98	98	98	98
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.2	3.2	3.0	3.2	3.2

34. Amount of

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	2	1	1
2.5	5	3	8	7	5
2.8	13	8	16	17	13
3.0	23	16	26	27	22
3.3	41	34	44	46	42
3.5	55	50	56	59	56
3.7	68	65	67	71	68
3.9	79	78	78	80	79
4.1	86	87	86	87	87
4.3	92	93	91	92	92
4.5	96	96	95	96	96
4.7	98	99	97	98	98
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.4	3.5	3.4	3.4	3.4

35. Difficulty desire to take course

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	1	0	2	0	1
2.5	5	3	7	5	6
2.8	12	9	16	13	14
3.0	22	19	27	23	25
3.3	43	40	47	43	46
3.5	57	56	60	56	61
3.7	69	69	72	68	73
3.9	79	80	81	77	83
4.1	86	87	88	85	89
4.3	92	93	92	91	94
4.5	96	96	96	95	97
4.7	98	98	98	98	99
4.9	99	99	99	99	99

36. Strong

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	1
2.5	4	3	5	5	5
2.8	11	7	11	11	12
3.0	17	13	17	17	18
3.3	29	25	28	30	31
3.5	39	35	37	41	40
3.7	50	45	48	52	51
3.9	61	56	59	64	62
4.1	71	66	69	74	72
4.3	80	75	79	84	82
4.5	89	84	88	91	90
4.7	94	91	94	96	96
4.9	98	97	98	99	99

5.0	99	99	99	99	99
Avg.	3.4	3.5	3.3	3.4	3.4

5.0	99	99	99	99	99
Avg.	3.7	3.8	3.7	3.6	3.6

37. Worked hard instructor

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	3	1	5	3	3
2.8	8	4	13	9	9
3.0	15	9	21	16	16
3.3	30	23	38	33	33
3.5	44	37	52	47	47
3.7	58	53	64	61	61
3.9	72	68	75	74	74
4.1	82	79	83	83	85
4.3	89	88	90	90	92
4.5	95	93	95	95	96
4.7	98	97	97	98	98
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.6	3.7	3.5	3.5	3.5

38. Wanted

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	1	1	1	1	1
2.5	8	9	8	8	9
2.8	19	20	18	18	21
3.0	28	31	27	27	31
3.3	45	47	42	43	47
3.5	56	59	54	54	58
3.7	66	69	64	65	69
3.9	75	77	74	74	77
4.1	83	84	81	82	84
4.3	89	90	87	89	90
4.5	94	94	93	93	94
4.7	97	97	96	97	97
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.4	3.4	3.4	3.4	3.4

39. Wanted course

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	1	1
2.5	7	4	7	8	7
2.8	17	12	18	20	17
3.0	27	21	28	31	28
3.3	47	38	48	52	48
3.5	62	52	62	67	63
3.7	74	65	75	80	75
3.9	84	77	85	89	86
4.1	91	85	92	94	93
4.3	95	91	96	97	97
4.5	98	96	98	99	99
4.7	99	98	99	99	99
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.3	3.5	3.3	3.2	3.3

40. Increased positive attitude (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	2	1	2	2	2
2.8	5	4	5	5	6
3.0	9	7	9	9	10
3.3	17	15	17	18	19
3.5	25	23	25	26	27
3.7	35	32	35	37	36
3.9	47	45	46	50	48
4.1	60	58	60	63	61

40. Increased positive attitude (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	1	1
2.5	3	3	3	3	4
2.8	7	7	7	7	8
3.0	11	11	11	11	13
3.3	21	21	20	20	23
3.5	30	31	30	29	32
3.7	41	43	41	39	43
3.9	54	57	53	52	55
4.1	67	69	66	65	67

4.3	74	72	74	76	74
4.5	85	84	86	88	85
4.7	94	93	94	95	94
4.9	98	98	99	99	99
5.0	99	99	99	99	99
Avg.	3.9	3.9	3.9	3.8	3.8

4.3	78	81	78	77	78
4.5	87	89	87	86	87
4.7	93	94	94	93	93
4.9	97	97	97	97	96
5.0	98	98	98	98	97
Avg.	3.8	3.8	3.8	3.9	3.8

41. Excellent teacher (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	2	1	2	2	2
2.8	4	3	5	4	5
3.0	6	4	7	6	7
3.3	10	7	11	11	12
3.5	14	10	15	15	17
3.7	19	15	20	21	23
3.9	27	22	28	28	30
4.1	35	30	36	37	40
4.3	47	41	47	49	52
4.5	61	56	62	63	64
4.7	77	73	78	79	79
4.9	93	92	94	93	94
5.0	98	97	98	98	98
Avg.	4.2	4.3	4.2	4.2	4.1

41. Excellent teacher (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	1	0	0
2.5	2	1	3	2	3
2.8	4	3	6	4	6
3.0	6	5	8	7	8
3.3	11	9	13	12	14
3.5	16	13	17	17	19
3.7	22	18	24	22	26
3.9	29	25	31	30	34
4.1	40	35	41	40	44
4.3	52	48	53	52	57
4.5	67	64	67	66	70
4.7	81	80	82	80	84
4.9	92	91	93	91	94
5.0	96	95	96	95	96
Avg.	4.2	4.2	4.1	4.2	4.1

42. Excellent course (unadjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	2	1	2	2	3
2.8	5	3	5	5	6
3.0	8	5	8	8	10
3.3	15	11	15	17	19
3.5	23	17	23	24	27
3.7	32	25	32	34	36
3.9	43	37	43	46	47
4.1	56	50	56	59	59
4.3	69	65	69	72	72
4.5	82	80	82	84	83
4.7	92	91	92	93	92
4.9	98	98	98	98	98
5.0	99	99	99	99	99
Avg.	3.9	4.0	3.9	3.9	3.9

42. Excellent course (adjusted)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	1
2.5	3	2	3	3	4
2.8	6	4	7	6	8
3.0	10	8	10	10	13
3.3	18	15	19	19	23
3.5	26	23	27	27	31
3.7	36	34	37	36	41
3.9	48	47	49	48	53
4.1	61	60	61	60	65
4.3	74	73	73	73	76
4.5	84	84	84	83	86
4.7	92	91	92	91	92
4.9	96	96	97	96	96
5.0	97	97	98	97	98
Avg.	3.9	3.9	3.9	3.9	3.8

43. Usually work hard teaching methods

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0

44. Variety

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0

2.0	0	0	0	0	0
2.5	0	0	0	0	0
2.8	0	0	0	0	0
3.0	1	2	1	1	1
3.3	12	17	9	11	11
3.5	32	39	26	30	31
3.7	57	63	51	58	56
3.9	80	83	77	82	79
4.1	92	93	91	94	92
4.3	97	97	97	98	98
4.5	99	99	99	99	99
4.7	99	99	99	99	99
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.6	3.6	3.7	3.6	3.6

2.0	0	0	1	1	1
2.5	3	2	2	3	3
2.8	6	4	5	7	6
3.0	9	7	8	10	10
3.3	17	14	16	18	18
3.5	24	22	23	26	26
3.7	35	32	34	37	37
3.9	48	47	47	50	51
4.1	63	62	62	65	65
4.3	77	78	77	79	78
4.5	89	90	89	90	89
4.7	96	96	96	97	96
4.9	99	99	99	99	99
5.0	99	99	99	99	99
Avg.	3.8	3.9	3.8	3.8	3.8

45. Students given responsibility

achievement standards

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	0	0	0
2.8	0	0	0	0	0
3.0	0	0	0	0	0
3.3	0	0	0	0	0
3.5	1	1	1	1	2
3.7	4	4	4	3	5
3.9	11	11	11	10	14
4.1	25	24	25	24	28
4.3	46	45	47	47	50
4.5	71	71	72	72	73
4.7	89	89	90	90	90
4.9	98	98	98	98	98
5.0	99	99	99	99	99
Avg.	4.3	4.3	4.3	4.3	4.3

46. High

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	0	0	0	0	0
2.5	0	0	0	0	0
2.8	0	0	0	0	0
3.0	1	1	1	0	1
3.3	3	2	4	2	4
3.5	7	6	9	6	9
3.7	14	12	16	13	18
3.9	27	25	29	27	32
4.1	44	42	47	44	49
4.3	64	63	66	64	67
4.5	81	81	81	81	83
4.7	92	93	92	92	93
4.9	98	98	98	98	99
5.0	99	99	99	99	99
Avg.	4.1	4.1	4.1	4.1	4.1

47. Used educational technology

Student Interest (4 items)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
1.5	0	0	0	0	0
2.0	2	1	4	3	2
2.5	9	6	13	11	9
2.8	16	12	22	18	15
3.0	21	18	29	25	21
3.3	32	28	41	36	31
3.5	40	37	49	44	39
3.7	49	46	57	53	48
3.9	58	56	66	62	58
4.1	68	66	74	70	67
4.3	77	76	81	78	77
4.5	86	86	89	86	86
4.7	93	93	95	93	93
4.9	98	98	98	98	98
5.0	99	99	99	99	99
Avg.	3.6	3.7	3.5	3.6	3.6

Stimulating

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
10.0	0	0	1	0	1
11.0	2	1	2	2	2
12.0	4	3	5	4	5
13.0	8	7	9	8	11
14.0	16	13	17	16	19
15.0	28	24	30	29	31
15.5	36	32	38	38	39
16.0	45	40	48	47	48
16.5	55	51	59	58	57
17.0	65	61	69	68	66
17.5	75	72	79	78	75
18.0	84	82	87	86	83
18.5	91	90	93	92	90
19.0	96	95	97	97	95
20.0	99	99	99	99	99
Avg.	15.9	16.2	15.8	15.9	15.8

Fostering Student Collaboration (3 items)

Rapport (4 items)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
5.0	0	0	0	0	0
6.0	1	1	1	2	2
7.0	5	4	5	5	5
8.0	11	10	11	12	11
9.0	19	19	20	22	18
10.0	30	30	32	33	28
11.0	44	44	47	47	41
11.5	52	53	56	55	48
12.0	61	62	66	63	58
12.5	70	72	76	72	67
13.0	79	81	84	81	76
13.5	88	89	92	89	85
14.0	94	95	96	95	93
14.5	98	98	99	98	97
15.0	99	99	99	99	99
Avg.	11.0	11.0	10.8	10.9	11.1

Establishing

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
10.0	0	0	1	0	1
11.0	1	1	2	1	2
12.0	3	3	3	3	4
13.0	7	6	7	7	9
14.0	14	12	14	14	16
15.0	25	23	25	25	27
15.5	32	30	34	33	35
16.0	41	40	43	42	43
16.5	51	50	54	52	53
17.0	62	62	65	63	63
17.5	73	73	76	74	72
18.0	83	83	86	84	82
18.5	91	91	92	92	90
19.0	96	96	97	97	95
20.0	99	99	99	99	99
Avg.	16.1	16.2	16.0	16.1	16.0

Encouraging Student Involvement (4 items)

Classroom Experience (5 items)

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
10.0	1	1	1	1	1
11.0	3	3	4	4	4
12.0	7	6	8	8	8
13.0	13	12	13	14	14
14.0	22	20	23	23	23
15.0	34	32	36	36	35
15.5	41	40	45	44	41
16.0	49	48	53	53	48
16.5	58	58	62	61	56
17.0	67	68	71	70	65
17.5	76	77	80	78	73
18.0	84	86	88	86	81
18.5	91	92	94	92	89
19.0	96	96	97	96	95
20.0	99	99	99	99	99
Avg.	15.6	15.7	15.5	15.5	15.7

Structuring

Mean	All	2-Yr	BA,BS	MA,MS	Doct.
13.0	0	0	0	0	1
15.0	2	1	2	2	3
17.0	6	5	7	7	8
18.0	11	8	12	11	14
19.0	18	14	19	19	23
20.0	28	23	30	30	34
20.5	35	29	38	37	41
21.0	43	37	46	45	49
21.5	52	45	56	54	58
22.0	61	55	66	64	66
22.5	71	66	77	75	75
23.0	81	77	86	84	83
23.5	89	87	93	91	90
24.0	95	94	97	96	95
25.0	99	99	99	99	99
Avg.	20.9	21.3	20.7	20.8	20.6

Average ratings were generally about the same for institutions of various sizes (less than 1000; 1000-2499; 2500-4999; 5000-9999; and 10,000+). Of the 47 items, differences in average ratings among these groups exceeded 0.1 on only 12. Results for these 12 items are shown in Table 10.

Table 10

Average Ratings by Institutional Size on Twelve Items

	All Classes	Institutional Size				
		<1,000	1,000-2,499	2,500-4,999	5,000-9,999	10,000 +
5. Formed "teams" or "discussion groups"	3.5	3.3	3.4	3.6	3.6	3.5

11. Related course to real life situations	4.2	4.1	4.2	4.2	4.2	4.3
16. Asks students to share with diverse others	3.7	3.6	3.6	3.7	3.7	3.8
17. Provided frequent feedback on tests	4.1	4.0	4.0	4.1	4.1	4.2
20. Encouraged out-of-class interactions	3.9	3.7	3.8	3.9	3.9	3.9
47. Used educational technology	3.6	3.5	3.5	3.6	3.7	3.7
25. Progress on "team skills"	3.5	3.3	3.3	3.4	3.5	3.5
26. Progress on "creative capacities"	3.4	3.5	3.3	3.4	3.4	3.4
29. Progress on "finding, using resources"	3.6	3.5	3.4	3.5	3.6	3.6
33. Amount of required reading	3.2	3.0	3.1	3.2	3.2	3.2
35. Course difficulty	3.4	3.3	3.4	3.4	3.5	3.4
36. Strong desire to take the course	3.7	3.7	3.6	3.6	3.6	3.8

On most of these items, average ratings for institutions with the smallest enrollments tended to be lower than those for larger institutions. However, on an overall basis, the differences were too slight to conclude that institutional size had a significant influence on ratings.

II. The Structure of the Ratings

Although students and faculty both rate 12 learning objectives, it is possible that a smaller number of "dimensions" would be adequate to describe "goals" or "progress." Similarly, student ratings of 20 teaching methods may well represent fewer than 20 teaching "styles."

To determine if there was a meaningful underlying structure to either the ratings of objectives or ratings of teaching methods, three Maximum Likelihood Factor Analyses with Orthogonal Rotation[4] were conducted. One of these was for faculty ratings of the importance of the 12 objectives; a second was for student ratings of progress of these objectives; and the third was for student ratings of teaching methods. Results for both the Short and Diagnostic Forms were used in these analyses.

In all analyses, factors with eigenvalues greater than 1.0 were extracted and rotated by the Varimax method. Rotated factor loadings of faculty ratings of the importance of the 12 objectives are shown in Table 11.

Table 11
Rotated Factor Loadings for
Faculty Ratings of the Importance of Objectives

Objective	Factor I	Factor II	Factor III
11. Learning to *analyze* and *critically evaluate* ideas, arguments, and points of view	.71	.09	.02
12. Acquiring an interest in learning more by asking questions and seeking answers	.68	.30	.25
8. Developing skill in expressing oneself orally or in writing	.56	.15	-.31
9. Learning how to find and use resources for answering questions or solving problems	.54	.42	.12
10. Developing a clearer understanding of, and commitment to, personal values	.53	.16	.07
7. Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc.)	.43	-.04	-.12
6. Developing creative capacities (writing, inventing, designing, performing in art, music, drama, etc.)	.35	.33	-.20
4. Developing specific skills and points of view needed by professionals in the fields related to this course	-.04	.67	.11
5. Acquiring skills in working with others as a member of a team	.33	.43	-.04
3. Learning to *apply* course material (to improve thinking, problem solving, and decisions)	.22	.42	.30
2. Learning fundamental theories, principles	.05	.07	.65
1. Gaining factual knowledge (terminology, trends, etc)	-.10	.06	.61

Although the structure that emerged from this analysis was somewhat ambiguous, there were three relatively clear groupings of objectives. The first loading principally on Factor I, and included (in abbreviated form) *Critical analysis, Interest in learning, Values development, Broad liberal education,* and *Communication skills*. Taken together, these objectives seem to emphasize *Intellectual Development.*

Three other objectives loaded primarily on Factor II—*Professional skills, viewpoints; Applications;* and

Team skills. The common focus of these objectives appears to be *Professional Preparation*.

Finally, two objectives loaded primarily on Factor III—*Principles and theories* and *Factual knowledge*. These objectives both stress *Basic Cognitive Development*.

The other two objectives (*Creative capacities; Finding and using* resources) appeared to represent a combination of Factor I (*Intellectual Development)* and Factor II (*Professional Skills*). Conceptually, then, faculty objectives centered on *Basic Cognitive Development*, a broader *Intellectual Development*, or *Professional Preparation*; but two objectives appeared to combine the last two of these.

Did student ratings of their progress parallel faculty ratings of importance? Table 12 explores this question.

Table 12
Rotated Factor Loadings for
Student Ratings of Progress on Objectives

Objective	Factor I	Factor II
8. Developing skill in expression myself orally or in writing	.91	.17
6. Developing creative capacities	.85	.19
11. Learning to *analyze* and *critically evaluate* ideas, arguments, and points of view	.75	.45
10. Developing a clearer understanding of personal values	.75	.44
7. Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, etc.)	.73	.26
9. Learning how to find and use resources	.62	.53
5. Acquiring skills in working as a member of a team	.59	.30
2. Learning basic principles, generalization, or theories	.22	.92
1. Learning factual knowledge (terminology, etc.)	.18	.91
3. Learning to *apply* course material	.44	.79
4. Developing professional competencies, points of view	.43	.78
12. Acquiring an interest in learning more	.63	.66

In this analysis, only two factors were extracted. The structure of progress ratings appears generally different from that of faculty "importance" ratings. The one clear similarity between the two involves the two objectives that had high loadings on Factor II but low ratings on Factor I in Table 12 (*Principles and theories; Factual knowledge*). This was called *Basic Cognitive Development* in the previous analysis, and might be labeled *Building a Cognitive Background* in the present analysis.

All other objectives had substantial loadings on Factor I, ranging from .43 to .91, together with a wide range of loadings on Factor II. It can be inferred that all were perceived to involve cognitive development in addition to some other kind of development, represented by the Factor II rotated loading. An examination of the rotated loadings on both factors suggests that various combinations of these loadings represent different ways students use their backgrounds to advance educational competencies:

1. *Professional Development* (Objectives 3 and 4; loadings on Factors I and II of .44/.79 and .43/.78, respectively).
2. *Intellectual Development* (Objectives 7, 10, and 11; loadings on Factors I and II

were .73/.26, .75/.44, and .75/.45, respectively).

3. *Expressiveness* (Objectives 6 and 8; loadings of .85/.19 and .91/.17).
4. *Life Long Learning Skills* (Objectives 5, 9, and 12; loadings of .59/.30, .62/.53, and .63/.66).

Although the terminology suggested by the analysis of student ratings is similar to that used in describing faculty ratings, the two analyses do not always agree on the placement of individual objectives. They did agree that *Basic Cognitive Development* is being stressed by the first two objectives and that the third and fourth objectives related to *Professional Development*. Furthermore, Objectives 7, 10, and 11 were classified as *Intellectual Development* in both analyses. But *Expressiveness* and *Life-Long Learning Skills,* which seemed to emerge from the student analysis, were not evident as separate dimensions in the faculty ratings.

It can be concluded that conceptualizations of faculty aspirations and student perceived outcomes have much in common. Both agree that conceptualization should include *Basic Cognitive Development, Professional Development,* and *Intellectual Development*. Student ratings offer two additional ways of conceptualizing the advancement of educational competencies—*Expressiveness* and *Life Long Learning Skills*. It should be noted that the two objectives not readily classified in the faculty analysis were included in the last two dimensions of the student analysis (*Creative capacities* as an *Expressiveness* objective and *Finding, using resources* as a *Life Long Learning* objective).

It appears that the first two objectives are sufficiently redundant that, in subsequent revisions of the instrument, they could be combined. Other than that, the mathematical structures that emerged from these analyses were not very crisp. They may provide some guidance to those interested in developing conceptual schemes for describing the purposes of higher education, and will be used to classify the objectives in the IDEA Center's *Directions to Faculty*. But they provided no reason to alter the current focus of the IDEA system on the relative importance of each individual objective.

The final factor analysis was performed on student ratings of the 20 instructional methods Two factors were extracted. Rotated factor loadings are shown in Table 13.

Table 13
Rotated Factor Loadings for Student Ratings of Instructional Methods

Method	Factor I	Factor II
10. Explained material clearly and concisely	.89	.25
6. Made it clear how each topic fit into course	.86	.35
4. Demonstrated the importance of the subject matter	.86	.34
12. Gave tests etc. that covered most important points	.80	.15
13. Introduced stimulating ideas about the subject	.78	.48
2. Found ways to help students answer own questions	.76	.51
1. Displayed a personal interest in students	.74	.47
3. Scheduled course work to help students stay up-to-date	.74	.36
17. Provided timely and frequent feedback on tests etc.	.69	.28
11. Related course material to real life situations	.68	.36
8. Stimulated students to high intellectual effort	.67	.53
7. Explained the reasons for criticisms	.62	.60
20. Encouraged out-of-class student-faculty interaction	.56	.49
15. Inspired students to set high achievement goals	.60	.69
18. Asked students to help each other understand ideas	.43	.76
16. Asked students to share ideas with diverse others	.38	.75
19. Gave assessments that required original thinking	.39	.74
9. Encouraged students to use multiple resources	.35	.66
5. Formed "teams" or "discussion groups"	.09	.75
14. Involved students in "hands on" experiences	.27	.75

An examination of the rotated factor loadings suggests that the first factor focuses on the instructor's role in transmitting knowledge while the second emphasizes the student's role in acquiring knowledge.

Within these broad categories, subgroups of items can be formed by attending to the relative size of the rotated loading on the two factors. The first subgroup (high loadings on Factor I; relatively low loadings on Factor II) appears to emphasize *providing a clear classroom structure;* the focus seems to be on course content. The next two item subgroups appear to center on increasing student motivation, a potent influence on learning. One aspect of motivation is reflected in the second subgroup (relatively high loadings on Factor I; moderate loadings on Factor II), which features ways of *stimulating student interest.* The four items in the next subgroup (where loadings on the two factors were nearly equal) emphasized a related approach to improving student motivation—methods designed to *stimulate student effort.* Although attracting interest in the subject is often the first step in motivating students, additional efforts may be required to encourage the student effort that learning requires.

The final two subgroups both have high loadings on Factor II, the factor stressing the student's role in learning. The first stresses *involving students* in learning activities, it reflects the adage that the best way to learn something is to teach it. The second emphasizes *student interaction*; activities requiring the exchange of student views or team participation represent another way instructors may facilitate learning.

Although the high inter-correlations among methods items resulted in a somewhat ambiguous factor structure, the sub-groupings of items make intuitive sense. Effective instruction requires attention to content; faculty members need to be not only authorities in their field but expert in organizing and communicating that content. Especially in lower division undergraduate courses, where student motivation is often low or marginal, the effective instructor must also attend to student readiness to learn, both by finding ways to capture student interest and by stimulating student effort. Although at times teaching is necessarily centered on the instructor's input, effective instructors know that student learning is as much a function of what the student does as how the instructor proceeds.

These "dimensions of effective teaching" are clearly not independent; a fact reflected in both the high item inter-correlations and the somewhat ambiguous factor structure. Classroom observations are consistent with this conclusion. Effective teachers typically organize and present class content. But at the same time, and sometimes with the same techniques, they elicit student interest, encourage student effort, and involve students in the teaching-learning process. It may be unwise and fruitless to conceptualize the "art" of teaching as a series of discrete and unrelated techniques.

Prior to the conduct of these analyses, IDEA staff had proposed five *a priori* scales be developed using the 20 standard methods items. These scales were modeled after those developed by The National Survey of Student Engagement (NSSE)[5] to describe features of the campus environment which promote student learning. Because the IDEA scales were limited to the classroom environment, and because they had not been empirically developed, they were given slightly different names than those employed by NSSE. They were called *Stimulating Student Interest, Fostering Student Collaboration, Establishing Rapport, Encouraging Student Involvement,* and *Structuring the Classroom.* The similarity of these names to those suggested for the five subgroups produced by the factor analysis is obvious, even though there was only a moderate overlap among the specific items included on "scales" with similar names. Although there would be a modest statistical advantage in revising the content of these scales in accordance with findings from the factor study, the advantages gained by refining the scales was judged to be outweighed by the disadvantage of sacrificing longitudinal comparisons.

In summary, results from the factor analyses were relatively ambiguous. When methods were analyzed, five alternative approaches to instruction were identified. These approaches were far from independent, suggesting that the effective instructor must be prepared to adjust strategies to different times and circumstances. The analyses of objectives show that, while they could be grouped into a smaller number of categories, these groupings were not entirely distinct. Therefore, it seems advisable (with the possible exception of objectives concerned with basic cognitive development) to continue having instructors select the pattern of objectives that best describes their intentions without regard for how these objectives relate to each other.

III. The Process of Adjusting Ratings

Teaching effectiveness is assessed in three ways—(1) the ratings of progress on individual objectives chosen as important or essential by the instructor; (2) the weighted average for objectives chosen by the instructor (Progress on Relevant Objectives - PRO); and (3) the three global measures (averages on *As a result of taking this course, I have more positive feelings toward this field of study; Overall, I rate this instructor as an excellent teacher;* and *Overall, I rate this an excellent course.* Effectiveness is reported in two ways—the simple average of student ratings on the measure and an "adjusted" measure. This section describes how "adjusted" scores were developed.

Ratings are adjusted to take into account, insofar as possible, the fact that matters influence them that are beyond the instructor's control. For example, if the majority of students were strongly motivated to take a class, ratings are likely to be higher than in classes with less interested students. Therefore, unless this is taken into account, instructors of highly motivated students would have an unfair advantage over those whose students were less interested and dedicated.

In addition to size of class, the Diagnostic Form contains a number of items that are potentially relevant as measures of "extraneous circumstances." The most apparent ones are Items 39 and 43 (*I really wanted to take this course regardless of who taught it; As a rule, I put forth more effort than other students on academic work.*) For convenience, scores are these items are called "Course Motivation" (CM) and "Work Habits" (WH), respectively.

Three other items were considered as relevant to potentially important extraneous circumstances—average ratings of Items 35, 36, and 37 (*Difficulty of subject matter; I had a strong desire to take this course;* and *I worked harder on this course than on most courses I have taken).* However, scores on these items could not be used as direct measures of extraneous influences because, at least in theory, each of them was, to a degree, under the control of the instructor. Obviously, the instructor controls many factors that make a course difficult or easy. Similarly, instructors can influence the amount of effort a student puts into a course. And, at least for some students, the desire to take a course may reflect the reputation its instructor has earned, a factor under the instructor's control.

Although ratings on these three items can be traced, in part, to instructor behavior or characteristics, they may also reflect factors that are not under the instructor's control. Course difficulty may, for example, reflect the fact that disciplines differ on the degree to which they stress content that is inherently difficult (complex, obscure). Similarly, students may have a strong desire to take a course for reasons unrelated to the instructor's reputation or behavior (the time of day the course was offered, the intent of friends to take the course, the need to satisfy some pre-requisite, etc.). And student effort may reflect, in addition to factors under the control of the instructor, such extraneous motivations as desire to be accepted in a professional school; desire to earn academic honors (or avoid academic dismissal); desire to impress someone else; etc.

To determine whether ratings on any of these items represented extraneous influences that ought to be included in the adjustment process, an effort was made to exclude the portion of variation that could be accounted for by instructor behavior. The procedure was to conduct step-wise multiple regression analyses[6] that employed each of these three measures as the dependent variable. For two of the items (difficulty and effort), 22 independent variables were employed (the 20 teaching methods items plus Items 33 and 34—*Amount of reading* and *Amount of other work*. For Item 36 (*I had a strong desire to take this course*), Item 38 *(I really wanted to take a course from this instructor*) was used as the independent variable. This permitted us to predict average ratings on each of these three items on the

basis of averages for the independent variables.

This prediction represented the average rating expected on the basis of relevant student characteristics. By subtracting the prediction from the obtained average, we obtained a residual that represented the average on the item after the instructor's influence had been removed. These residuals were labeled D_N (difficulty unrelated to the instructor), E_N (effort unrelated to the instructor), and OM (other motivation). A positive residual means that the average rating was higher than would be expected on the basis of the independent variable(s). In other words, after the influence of the instructor's approach to the class had been taken into account, student ratings of effort and difficulty were above average. The "difficulty" residual probably reflects differences among disciplines; some are inherently more challenging than others to the majority of students. The "effort" residual may reflect the adequacy of student background and/or student academic self-confidence.

In initial analyses, 7 independent variables made significant contributions to the prediction of Item 35 (difficulty); the same was true for Item 37 (Effort), although only 5 of the 7 significant variables were identical. In both instances, the partial regression weight for two of the measures was negative, a finding that invariably obscures interpretation. Furthermore, the amount of variance accounted for by two other measures was less than two percent of the total.

In the interest of simplicity, new analyses were undertaken which employed only the three most important measures. For both difficulty and effort, these were the average ratings on Items 33 (amount of reading), 34 (amount of other work), and 8 (stimulating intellectual effort). The formula for predicting "difficulty" was:

$$\text{Predicted } X_{35} = .13412\, X_8 + .23986\, X_{33} + .40303\, X_{34} + .74331;\ R^2 = .371$$
$$D_N = \text{Mean of } X_{35} - \text{Predicted } X_{35}$$

For "effort," these formulas were:

$$\text{Predicted } X_{37} = .35690\, X_8 + .11142\, X_{33} + .51595\, X_{34} + .06562;\ R^2 = .635$$
$$E_N = \text{Mean of } X_{37} - \text{Predicted } X_{37}$$

Both formulas are easy to understand; the more reading is required, the more "other work" is required, and the more the instructor is perceived to stimulate intellectual effort, the more difficult the course is perceived to be and the more effort students report putting forth. D_N and E_N tell us whether the difficulty and effort reported by students was more (positive residual) or less (negative residual) than was expected on the basis of instructor-controlled factors.

Other motivation (OM) was calculated by predicting the mean for Item 36 (*I had a strong desire to take this course*) from the mean of Item 38 (*I really wanted to take a course from this instructor*) and subtracting the result from the obtained mean on Item 36. The formula was:

$$\text{Predicted } \bar{X}_{36} = .57366\, \bar{X}_{38} + 1.71732;\ \bar{R}^2 = .327$$
$$OM = \text{Mean of } X_{36} - \text{Predicted } X_{36}$$

These results indicate that the desire to take a course can be partially explained by the desire to be exposed to a particular instructor. But a substantial portion of the variability in this measure is

apparently due to other (unspecified) motivations.

The next step in the adjustment process was to conduct step-wise multiple regression analyses which employed the 12 ratings of progress and the 3 global ratings as dependent variables and six independent variables—enrollment (N), CM (mean of Item 39), WH (mean of Item 43), D_N, E_N, and OM. When this was done, the OM measure was statistically significant in only two analyses; and in these two, it contributed less than 1 percent to the explained variance. Therefore, this measure was dropped and analyses were repeated using only five independent variables.

Table 14 provides information about statistically significant regression weights and other data needed to compute adjusted scores. Appendix B shows calculations for an example.

Table 14
Regression Coefficients and Constants for Adjusting Ratings On the Diagnostic Form

Criterion	Con-stant	Regression Coefficient[1]					$1+R^2$	Grand Mean
		CM	WH	N	D_N	E_N		
21. Factual knowledge	1.69981	.27568	.38141	---	.09434	-.07217	1.176	4.0013
22. Principles and theories	1.67498	.25225	.39835	-.00065	.09683	-.12443	1.163	3.9443
23. Applications	1.55086	.27966	.43610	-.00255	-.10759	-.12437	1.225	3.9874
24. Prof skill, viewpoints	1.45513	.32015	.42804	-.00284	-.09290	-.06913	1.238	4.0420
25. Team skills	1.36271	.20224	.51612	---	-.26412	-.11336	1.161	3.9285
26. Creative Capacities	1.74672	.20146	.45071	-.01175	-.47119	.09341	1.194	3.8668
27. Broad liberal education	1.12469	.24898	.51462	-.00463	-.28984	-.14497	1.165	3.6948
28. Communication skills	2.17413	.03283	.44629	-.00774	-.57321	---	1.193	3.7887
29. Find, use resources	1.34473	.14364	.54934	-.00487	-.19646	-.17466	1.169	3.7322
30. Values development	1.15089	.25370	.47874	---	-.24761	-.19709	1.160	3.7779
31. Critical analysis	1.96267	.13407	.42156	-.00354	-.19952	-.15229	1.119	3.8438
32. Interest in learning	1.32320	.26505	.17280	-.00578	-.10333	-.12346	1.206	3.7907
40. Increased positive attitude	1.00177	.51242	.33205	-.00113	-.22342	.07431	1.361	3.8611
41. Excellent teacher	2.58021	.24024	.23139	-.00122	-.14747	-.18191	1.088	4.1815
42. Excellent course	1.35036	.47249	.28732	-.00136	-.21410	.05304	1.294	3.9198

[1]CM=Course Motivation (item 39), WH=Work Habits (item 43), N=enrollment, D_N=Difficulty unrelated to the instructor, E_N=Effort unrelated to the instructor

Note: Analyses reported in Table 14 are based on a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

It is clear from this table that "Work Habits" (WH, mean of Item 43) was generally the most potent predictor, followed by "Course Motivation" (CM, mean of Item 39). Classes that contained students who typically worked hard on their studies and/or were highly motivated to take the course regardless of who taught it were expected to receive favorable ratings; unless ratings were adjusted, the instructors of such classes would have an unfair advantage over colleagues with less motivated and less dedicated students.

The joint effect of these two variables is displayed In Table 15. Classes were sorted into 5 groups on the basis of average scores on Item 39 (course motivation). The "Low" group's average was in the lowest 10 percent of all averages; "Low Average" was in the next 20 percent; "Average" was in the middle 40 percent; "High Average" in the next 20 percent; and "High" in the upper 10 percent. Then each of these groups was sorted into five similarly defined groups on the basis of their average response to Item 43 (work habits). The resulting 5x5 matrix produced 25 groups. Average progress ratings on each of the 12 learning objectives for these 25 groups are shown in the table. The only classes included in this table were those for which the instructor identified the objective as "important" or "essential."

As seen in Table 15, the influence of these two variables on progress ratings is dramatized by comparing the two extreme groups ("Low/Low" vs. "High/High"). Differences ranged from 0.62 (for *Communication Skills*) to 1.17 (for *Professional skills and viewpoints*), averaging 0.96. Clearly, instructors in "High/High" classes have an enormous advantage over those in "Low/Low" classes; adjusted scores attempt to compensate for this advantage.

Table 15
Average Progress Ratings for Classes That Differ in Levels of Student Motivation (Item 39) and Student Work Habits (Item 43)

21. Gaining factual knowledge

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.51	3.66	3.80	3.95	4.08
Low Avg.	3.60	3.76	3.91	4.05	4.07
Average	3.73	3.87	4.02	4.12	4.21
High Avg.	3.88	3.97	4.13	4.23	4.33
High	4.01	4.12	4.25	4.33	4.48

22. Principles, theories

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.46	3.64	3.77	3.89	3.96
Low Avg.	3.58	3.71	3.86	3.98	3.98
Average	3.69	3.83	3.96	4.05	4.11
High Avg.	3.91	3.94	4.09	4.15	4.25
High	3.95	4.10	4.18	4.26	4.43

23. Applications

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.53	3.67	3.75	3.88	3.96
Low Avg.	3.63	3.73	3.90	4.00	4.06
Average	3.69	3.84	4.00	4.10	4.23
High Avg.	3.85	4.00	4.12	4.25	4.34
High	3.98	4.13	4.25	4.35	4.53

24. Professional skills, viewpoints

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.38	3.58	3.78	3.96	4.11
Low Avg.	3.51	3.70	3.88	4.05	4.15
Average	3.64	3.83	4.01	4.14	4.28
High Avg.	3.76	3.96	4.14	4.29	4.38
High	4.04	4.13	4.28	4.38	4.55

25. Team skills

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.49	3.58	3.66	3.74	3.75
Low Avg.	3.65	3.68	3.75	3.86	3.92
Average	3.67	3.83	3.92	3.94	4.09
High Avg.	3.81	4.01	4.06	4.11	4.16
High	3.94	4.16	4.26	4.27	4.47

26. Creative capacities

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.46	3.51	3.54	3.71	3.85
Low Avg.	3.55	3.61	3.68	3.87	4.05
Average	3.57	3.68	3.83	3.93	4.12

High Avg.	3.70	3.88	3.97	4.08	4.17
High	4.31	4.03	4.17	4.26	4.39

27. Broad liberal education

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.15	3.38	3.45	3.63	3.81
Low Avg.	3.27	3.50	3.57	3.68	3.88
Average	3.42	3.56	3.74	3.80	3.99
High Avg.	3.44	3.74	3.86	4.00	3.97
High	3.75	3.98	4.04	4.23	4.28

28. Communication skills

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.54	3.63	3.60	3.57	3.66
Low Avg.	3.64	3.68	3.67	3.76	3.71
Average	3.67	3.76	3.80	3.79	3.80
High Avg.	3.69	3.91	3.94	3.91	3.91
High	3.83	4.01	4.07	4.08	4.16

29. Finding and using resources

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.45	3.44	3.49	3.55	3.65
Low Avg.	3.49	3.56	3.58	3.65	3.63
Average	3.57	3.63	3.71	3.77	3.85
High Avg.	3.63	3.82	3.87	3.91	3.99
High	3.86	3.98	4.08	4.12	4.27

30. Values development

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.23	3.42	3.59	3.71	3.74
Low Avg.	3.41	3.61	3.66	3.83	3.87
Average	3.47	3.64	3.80	3.85	3.85
High Avg.	3.70	3.81	3.95	4.03	4.05
High	3.82	3.91	4.11	4.17	4.34

31. Critical analysis

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.52	3.62	3.66	3.80	3.73
Low Avg.	3.60	3.70	3.75	3.86	3.83
Average	3.68	3.78	3.87	3.89	3.91
High Avg.	3.79	3.92	3.99	4.02	4.07
High	3.77	4.02	4.12	4.17	4.28

32. Interest in continued learning

Work Habits (Item 43)	Student Motivation (Item 39)				
	Low	Low Avg.	Avg.	High Avg.	High
Low	3.29	3.45	3.55	3.71	3.77
Low Avg.	3.41	3.56	3.65	3.79	3.93
Average	3.48	3.63	3.81	3.89	4.02
High Avg.	3.64	3.82	3.93	4.02	4.14
High	3.77	4.00	4.10	4.19	4.38

The regression coefficient for "Enrollment" (N) was not always statistically significant; but when it was, it was always negative, meaning the larger the class, the lower the predicted (expected) rating. Those teaching small classes have an advantage over those teaching large classes; hence, in the interest of fairness, ratings should be adjusted to take this into account.

Except for the first two criterion ratings, the regression coefficient for D_N was always negative. Generally, if the discipline was perceived as difficult (after taking into account the impact of the instructor on perceived difficulty), an attenuated outcome can be expected. This was especially apparent in progress ratings on "Creative capacities" and "Communication skills" where high difficulty was strongly associated with low progress ratings. The two exceptions, where "disciplinary difficulty" had a positive effect on the predicted outcome, were for the progress ratings concerned with basic cognitive development ("Factual knowledge" and "Principles and theories"). Consistent with other research regarding the influences of difficulty, this finding refutes conventional wisdom (high difficulty=low ratings).

In most cases, student effort in the class (adjusted for the instructor's influence on effort) was also negatively related to predicted ratings. Classes containing an unusually large number of students who worked harder than the instructor's approach required ended up with lower progress ratings. As noted earlier, this may be because those who found it necessary to put in extra effort were those whose backgrounds did not prepare them well for the class. They may also be students who lack self-confidence and, for this reason, under-achieve (or under-estimate their progress in a self-abasing manner).

Adjustments for the three global ratings merit special scrutiny. Regression results for predicted scores on "Increased positive attitude" and "Excellent course" were similar to each other. The order of the most influential predictors was reversed over that found for individual progress ratings; CM (desire to take the course regardless of who was teaching it) was the clear leader, and WH (tendency to work hard in academic studies) was a relatively distant second. Classes perceived as very difficult (D_N) were generally rated low on these measures, but (again in contrast to the findings for individual progress ratings) those with substantial numbers of students who worked hard in the class generally rated it more favorably. In other words, when students worked harder than required by the instructor, they tended to have good impressions of both the discipline and the course, even though their ratings of progress on relevant objectives tended to be low. But both global ratings and specific progress ratings tended to be low in disciplines perceived to be inherently difficult.

The other global rating ("Excellent instructor") was not predicted with much accuracy (R^2=.0883); these measures of extraneous influences were not very predictive of students' overall impressions of their instructors[7]. Although significant regression weights were found for all five independent variables, these were all of modest magnitude. CM and WH were about equal in their influence on such ratings, while the adjusted ratings for "Difficulty" and "Effort" had a more moderate (and negative) influence. Enrollment size had a very minor and negative influence. Thus, instructor "popularity" was not accurately predicted by these measures, but student motivation and dedication did have a moderate positive influence while disciplinary difficulty and student effort had a slight negative influence.

The formula for adjusting means for progress ratings (Items 21-32) and global ratings (Items 40-42) is Grand Mean + (Obtained Mean – Predicted Mean)*(1 + R^2). This formula produces adjusted values with approximately the same mean and standard deviations as those obtained for unadjusted measures.

Adjustments to ratings on the Short Form were less precise because it provided no information on WH, D_N or E_N. Since WH (work habits) was the most potent measure of relevant extraneous circumstances, its omission from the Short Form was especially regrettable. In later versions of this instrument, this item will be added. Until that time, it was decided to retain the adjustment formulas and process that have been in place since the 1998-99 school year.

The formula for predicting OM (other motivation) was developed from Short Form results; it is similar to, but not identical with, that reported earlier for the Diagnostic Form.

Predicted Mean of Item 13 = .519087 X_{14} + 1.804711

OM = Mean Item 13 – Predicted Mean, Item 13

Table 16 provides information regarding regression coefficients and constants used in adjusting Short Form scores.

Table 16
Regression Coefficients and Constants for Adjusting Ratings On the Short Form

Criterion	Constant	Regression Coefficient			$1+R^2$	Grand Mean
		CM	OM	N		
1. Factual knowledge	2.83473	.32094	-.06596	---	1.102	3.9038
2. Principles and theories	3.07102	.23693	---	---	1.084	3.8526
3. Applications	2.87594	.31386	-.12552	-.00239	1.072	3.8536
4. Professional skills, viewpoints	3.00560	.30163	---	-.00262	1.117	3.9764
5. Team skills	1.92292	.53771	-.23726	-.01384	1.100	3.3749
6. Creative capacities	3.18263	.23181	---	-.00504	1.070	3.8348
7. Broad liberal education	3.12332	.19650	---	-.00326	1.034	3.6707
8. Communication skills	3.57679	.13616	-.18760	-.00951	1.046	3.8055
9. Find, use resources	2.42522	.44526	-.18993	-.01693	1.104	3.4819
10. Values development	2.95472	.26901	-.14057	-.00916	1.090	3.6285
11. Critical analysis	2.71324	.27491	-.10031	-.00639	1.072	3.4837
12. Interest in learning	3.15930	.16133	-.15513	---	1.011	3.7065
16. Increased positive attitude	2.28507	.47865	---	---	1.212	3.8708
17. Excellent teacher	2.63471	.45726	-.38354	---	1.060	4.1496
18. Excellent course	2.22667	.49763	---	---	1.238	3.8752

Clearly, course motivation (CM) was the most important extraneous variable taken into account by adjustments to the Short Form; the stronger the desire of students to take the course regardless of who taught it, the more likely high progress ratings would be reported. The other two measures of influences beyond the instructor's control (size of class and "other motivation") did not always have significant regression weights. When they did, their weights were negative. If classes were large and/or if "extraneous" student motivation (motivation unrelated to a desire for a specific instructor) was low, it was probable that progress ratings would be negatively affected, making it necessary to adjust the ratings.

To estimate the amount of improvement to Short Form adjustments which might be anticipated if the WH item were included, all calculations related to adjustments were performed using Diagnostic Form data but omitting D_N and E_N, the measures of extraneous influences which would not be available on the Short Form. The amount of variance accounted for by extraneous measures (R^2) increased from an average of .094 to an average of .156, a very substantial improvement (see Appendix C).

IV. Reliability

Classes with 13-17 respondents were used to compute split half reliabilities for each of the 47 items and for the 5 teaching methods scales described in Section II of this report. Classes were randomly divided and means were computed for each half. These means were correlated. Results were taken as an estimate of the split half reliability of classes averaging 7.5 respondents. The Spearman-Brown Prophecy formula[8] was applied to estimate reliabilities for classes averaging 12.5, 24.5, 42.5, and 60 respondents (corresponding to class size ranges of 10-14, 15-34, 35-49, and 50+).

Standard deviations were also computed for each item[9] or scale and these were used, in conjunction with the computed reliabilities, to calculate standard errors of estimate. Results are shown in Table 17.

All measurements include a degree of "error." The data of Table 17 provide the user with information about the likely range within which the "true" mean falls (the theoretical average from an infinite number of administrations of the form). In general, the probability that the true mean will fall within ± one standard error of the obtained mean is approximately two out of three; 95 times in 100 it will fall within two standard errors of the obtained mean.

Table 17
Reliability and Standard Errors of Items and Scales
For Four Class Sizes

	All Classes		Class Size							
			10-14		15-34		35-49		50+	
Teaching Methods	**Mean**	**s.d.**	r_{11}	**s.e.**	r_{11}	**s.e.**	r_{11}	**s.e.**	r_{11}	**s.e.**
1. Displayed personal interest in students	4.34	.498	.81	.22	.89	.17	.93	.13	.95	.11
2. Helped students answer own questions	4.10	.520	.79	.24	.88	.18	.93	.14	.95	.12
3. Scheduled work helpfully	4.20	.481	.75	.24	.86	.18	.91	.14	.94	.12
4. Demonstrated imp of subject	4.32	.455	.77	.22	.87	.17	.92	.13	.94	.11
5. Formed teams, discussion groups	3.52	1.03	.90	.33	.95	.24	.97	.18	.98	.16
6. Made clear how topics fit	4.20	.506	.77	.24	.87	.18	.92	.14	.94	.12
7. Explained criticisms	3.78	.570	.72	.30	.84	.23	.90	.18	.93	.16
8. Stimulated intellectual effort	3.86	.573	.77	.27	.87	.21	.92	.17	.94	.14
9. Encouraged use of multiple resources	3.78	.696	.82	.29	.90	.22	.94	.17	.96	.14
10. Explained clearly	4.12	.610	.83	.25	.91	.19	.94	.15	.96	.12
11. Related to real life	4.22	.581	.82	.25	.90	.19	.94	.14	.96	.12
12. Tests covered important points	4.28	.492	.79	.23	.88	.17	.93	.13	.95	.11
13. Introduced stimulating ideas	4.03	.583	.81	.25	.89	.19	.94	.15	.95	.13
14. Involved students in hands on activities	3.76	.805	.84	.32	.91	.24	.95	.18	.96	.15
15. Inspired students to set high goals	3.76	.621	.78	.29	.88	.22	.92	.17	.95	.15
16. Asked students to share experiences	3.69	.790	.84	.32	.91	.24	.95	.19	.96	.16
17. Provided timely feedback	4.11	.593	.81	.26	.89	.20	.93	.15	.95	.13
18. Asked students to help each other	3.79	.642	.79	.30	.88	.22	.93	.17	.95	.15
19. Assessments required creativity	3.92	.649	.81	.28	.89	.21	.94	.17	.95	.14
20. Encouraged student/faculty contact	3.90	.627	.78	.29	.88	.22	.92	.17	.95	.15
Learning Objectives										
21. Factual knowledge	4.00	.495	.77	.24	.87	.18	.92	.14	.94	.12
22. Principles and theories	3.94	.485	.76	.24	.86	.18	.91	.14	.94	.12
23. Applications	3.99	.516	.75	.26	.85	.20	.91	.16	.93	.13
24. Professional skills, viewpoints	4.04	.424	.75	.21	.86	.16	.91	.13	.94	.11
25. Team skills	3.93	.632	.85	.24	.92	.19	.95	.14	.97	.12
26. Creative capacities	3.87	.701	.83	.29	.91	.21	.95	.16	.96	.14
27. Broad liberal education	3.69	.731	.79	.34	.88	.25	.93	.20	.95	.17
28. Communication skills	3.79	.676	.84	.27	.91	.20	.95	.16	.96	.13
29. Find, use resources	3.73	.571	.75	.28	.86	.22	.91	.17	.94	.14
30. Values development	3.78	.629	.79	.29	.88	.22	.93	.17	.95	.14
31. Critical analysis	3.84	.590	.78	.28	.87	.21	.92	.16	.94	.14
32. Interest in learning	3.79	.562	.73	.29	.84	.22	.90	.18	.93	.15
Course Ratings										
33. Amount of reading	3.20	.741	.89	.24	.94	.18	.97	.14	.98	.12
34. Amount of other work	3.42	.589	.81	.26	.89	.19	.94	.15	.95	.13
35. Difficulty of subject matter	3.42	.581	.82	.24	.90	.18	.94	.14	.96	.12
Self-ratings										
36. Strong desire to take the course	3.66	.671	.80	.30	.84	.23	.93	.18	.95	.15
37. Worked harder on this course than most	3.57	.557	.77	.27	.87	.20	.92	.16	.94	.14

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38. Wanted this instructor	3.40	.675	.80	.30	.89	.23	.93	.18	.95	.15
39. Wanted course regardless of instructor	3.33	.560	.65	.33	.78	.26	.86	.21	.90	.18
43. Usually work hard on academic work	3.64	.308	.39	.24	.56	.20	.69	.17	.76	.15
Global Ratings										
40. Increase positive attitude toward field	3.86	.602	.75	.30	.86	.23	.91	.18	.94	.15
41. Excellent instructor	4.18	.643	.83	.26	.91	.20	.94	.15	.96	.13
42. Excellent course	3.92	.607	.80	.27	.89	.21	.93	.16	.95	.14
Progress on Relevant Objectives (PRO)[a]	50.9	8.6	.78	4.0	88	3.0	.92	2.4	.95	2.0

[a]PRO ratings are standardized T Scores. The distribution has a mean of 50 and standard deviation of 10. All other ratings were made on a 5-point scale where 1=low and 5=high.

	All Classes		Class Size							
			10-14		15-34		35-49		50+	
Additional Method Items	**Mean**	**s.d.**	r_{11}	**s.e.**	r_{11}	**s.e.**	r_{11}	**s.e.**	r_{11}	**s.e.**
44. Used variety of evaluation methods	3.83	.596	.75	.30	.85	.23	.91	.18	.94	.15
45. Expected students to take responsibility	4.30	.326	.60	.21	.75	.16	.84	.13	.88	.11
46. High achievement standards	4.12	.413	.69	.23	.81	.18	.88	.14	.91	.12
47. Used educational technology	3.63	.773	.83	.32	.91	.24	.94	.18	.96	.15
Teaching Method Scales										
Stimulated Student Interest	4.03	.506	.84	.20	.91	.15	.95	.12	.96	.10
Fostering Student Collaboration	3.74	.709	.88	.24	.94	.18	.96	.14	.97	.12
Establishing Rapport	4.06	.490	.83	.20	.91	.15	.95	.12	.96	.10
Encouraging Student Involvement	3.97	.560	.86	.21	.92	.16	.95	.12	.97	.10
Structuring Classroom Experiences	4.20	.473	.85	.18	.92	.14	.95	.10	.97	.09

Ratings were made on a 5-point scale where 1=low and 5=high.
Note: Analyses reported in Table 17 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

For the five *a priori* scales, internal consistency reliabilities were computed using Cronbach's Alpha. [10] Since inter-correlations of items were generally high (see Table 6), these reliabilities were also high, as noted in Table 18.

Table 18
Internal Consistency Reliabilities for Teaching Method Scales

Scale	Coefficient Alpha
Stimulating Student Interest	.935
Fostering Student Collaboration	.844
Establishing Rapport	.920
Encouraging Student Involvement	.852
Structuring Classroom Experiences	.928

Note: Analyses reported in Table 18 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

V. Validity

What evidence is there that student ratings obtained from the IDEA system can be trusted? This section updates previous studies of the system's validity based on results obtained in the most recent three years. Four approaches to validity were taken.

1. The correlation of student progress ratings and instructor ratings of importance.

The first study is based on three assumptions: (1) instruction is effective; (2) instructors make meaningful and conscientious judgments when they rate the importance of each objective; and (3) students make accurate ratings of the progress they make on these objectives (the validity question under investigation). If all three assumptions are true, then there should be a positive correlation between the instructor's rating of importance and the students' average rating of progress. To the degree that any of these assumptions is less than 100% true (instruction is not effective, instructors were not always conscientious in identifying objectives, students did not estimate their progress accurately) this correlation will be reduced. The correlation will also be attenuated by the fact that importance ratings are made using only a 3-point scale. For these reasons, this test of validity is considered to be a severe one.

The bolded numbers in Table 5 provide the information required by this study. The average correlation between the instructor's rating of importance and students' average rating of progress on the corresponding objective across all 12 objectives was +.265. In contrast, the average correlation between instructor rating of importance of a given objective and student ratings of progress on the other 11 (irrelevant) objectives was +.024. These findings are consistent with those reported for other samples dating back to 1973. We conclude that students rate their progress on instructional objectives with more than minimal validity.

2. The consistency of student ratings with intuitive expectations.

The 20 "methods" items included on the IDEA form were chosen because they have been identified as "desirable" or "potent" teaching techniques. Therefore, if student ratings are valid, there should be a degree of correspondence between their ratings of progress and their perceptions of how frequently the instructor employed these "potent" methods. The data of Table 6 make it apparent that the expected correspondence occurred almost uniformly.

Aside from this expectation of general correspondence, there is the question of whether specific correlations make sense. An examination of relevant data in Table 6 shows that many intuitive expectations were met. For example, the teaching method most closely related to student ratings of progress on "Team skills" (Item 25) was *Formed teams or "discussion groups" to facilitate learning* (Item 5). Progress on "Learning to find and use resources for answering questions or solving problems" (Item 29) was most closely related to ratings of *Encouraged students to use multiple resources to improve understanding* (Item 9). Progress on "Developing a clearer understanding of, and commitment to, personal values" (Item 30) was most highly correlated with *Asked students to share ideas and experiences with others whose backgrounds and viewpoints differ from their own* (Item 16). Progress ratings on "Developing creative capacities" (Item 26) were most closely related to *Gave projects, tests, or assignments that required original or creative thinking* (Item 19).

Data provided earlier with respect to the impact of class size on correlations between instructional methods and student progress provides additional evidence that student ratings were consistent with intuitive expectations (see Table 7). Progress ratings on "Developing creative capacities" (Item 26) were substantially related to *Formed teams or "discussion groups" to facilitate learning* (Item 5) for very large classes (where personalized techniques are more problematical), but not for smaller classes. And progress ratings on "Developing a clearer understanding of, and commitment to, personal values" (Item 30) was closely related to *Asked students to help each other understand ideas and*

concepts (Item 18) if class size was less than 35 but was not so useful in larger classes.

3.The differential validity of the methods items.
Teaching methods items that were most highly correlated with progress ratings were relatively distinctive for each objective (see Table 7). Exceptions were the first two objectives (basic cognitive background) and the third and fourth objectives (applications; professional skills and viewpoints) where identical lists of "most relevant" teaching techniques were identified. But when lists of the eight "most relevant" methods for "Factual knowledge" and "Team skills" were compared, only three were on both. Generally, with the exceptions noted above, the amount of overlap between any two sets of "most relevant" items was approximately 50 percent. Unless students were making differential judgments in answering the questions, such distinctive patterns of relevant teaching methods would not have existed.

4. Correspondence between independently obtained student and faculty ratings.
Using the Faculty Information Form (see Appendix A) faculty participants are asked to respond to a number of questions about the specific class they are teaching. Their answers to these questions sometimes suggest how students might rate their progress or otherwise evaluate the instructor and class. Several studies were undertaken to determine if these expected relationships existed. Their presence would constitute evidence for the validity of the system since the instructors and students each made their ratings without knowledge of each other's views.

In the first of these studies, instructors were asked to rate the impact of various circumstances on the learning of students (Contextual Question 4). Circumstances were described as having a "Positive," "In between," or "Negative" impact on learning. Four of them were believed to be especially relevant to overall (global) outcomes: previous experience in teaching the course; desire to teach the course; adequacy of students' background and preparation for the course; and student enthusiasm.

Table 19 compares the average rating on the four global criteria—progress on relevant objectives (PRO) and three single-item ratings (increased positive attitude toward the subject; excellent teacher; excellent course)—for classes that were rated as having different impacts on student learning. PRO results are reported in T Scores, while those for the three individual ratings are based on the IDEA system's 5-point scale.

In every instance, the expected differences were found. In classes where the circumstance was expected to have a positive influence on student learning, global ratings were significantly higher than in those where the expected impact was negative. Classes with "in between" faculty ratings invariably had "in between" student ratings on these four measures.

Table 19
The Relationship Between Instructor Ratings of Selected Circumstances and Student Global Ratings of Teaching and Learning

Circumstance/ Expected Impact	Global Rating			
	PRO[1]	Increased Positive Attitude	Excellent Teacher	Excellent Course
Previously taught				
Positive (N=19805)	52.0	3.93	4.25	3.99
In between (N=2418)	50.3	3.81	4.07	3.81
Negative (N=516)	48.0	3.66	3.89	3.62
Desire to teach				
Positive (N=21333)	51.9	3.94	4.24	3.99
In between (N=3228)	49.4	3.71	4.01	3.74
Negative (N=192)	48.7	3.69	3.97	3.71
Student background				
Positive (N=7164)	52.8	4.02	4.27	4.06
In between (N=10386)	51.7	3.94	4.24	3.99
Negative (N=5513)	49.6	3.69	4.07	3.75
Student enthusiasm				
Positive (N=12214)	52.8	4.07	4.31	4.11
In between (N=7514)	51.2	3.86	4.18	3.90
Negative (N=3510)	47.9	3.50	3.94	3.56

[1]PRO (Progress on Relevant Objectives) ratings are standardized T Scores. The distribution has a mean of 50 and standard deviation of 10. All other ratings were made on a 5-point scale where 1=low and 5=high.
Note: Analyses reported in Table 19 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

A second study focused on the instructor's description of specific class emphases (Contextual Question 3). They indicated whether the class required "None," "Some," or "Much" of seven activities: writing, oral communication, computer applications, group work, mathematical/quantitative work, critical thinking, and creative/artistic/design endeavor. If the IDEA system is valid (if both instructor and student ratings can be trusted), then there should be a relationship between some of these emphases and progress on related objectives.

Specifically, if "writing" was emphasized, students should report above average progress on "Communication skills." If "critical thinking" was emphasized, above average progress should be reported on "Critical analysis." If "creative/artistic/design endeavor" was emphasized, students should report above average progress on "Creative capacities." And if "group work" was emphasized, student progress on "Team skills" should be relatively high.

Results are shown in Table 20.

Table 20
Relationship Between Instructor Emphasis and Relevant Student Progress Ratings

Student Progress Rating[a]		Instructor Emphasis: Writing		
		None	Some	Much
Communication Skills	Mean	3.36	3.61	4.01
	S. D.	.85	.70	.56
	N	428	5360	6134
		Instructor Emphasis: Critical Thinking		
		None	Some	Much
Critical Analysis	Mean	3.54	3.81	4.07
	S. D	.66	.59	.52
	N	1005	5777	5131
		Instructor Emphasis: Creative Endeavor		
		None	Some	Much
Creative Capacities	Mean	3.52	3.76	3.99
	S. D.	.83	.74	.61
	N	959	2561	2606
		Instructor Emphasis: Group Work		
		None	Some	Much
Team Skills	Mean	3.94	3.99	4.04
	S. D.	.67	.61	.57
	N	885	4363	3014

[a]This study used only courses where the learning objective was selected as "important" or "essential," making it a very conservative test of validity.
Note: Analyses reported in Table 20 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

All four F tests were highly significant (P<.0001). The expected relationships were confirmed, thus establishing validity for both instructor and student ratings.

In a third validity test in which instructor and student ratings were compared the focus was on two objectives: *Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course* and *Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc.).* If the IDEA system is valid, the first of these should be chosen much more frequently by those teaching professionally oriented courses (or courses related to the students' major field) while the second should be selected more frequently by instructors teaching courses directed to meeting general education or distribution requirements (as indicated by Contextual Question 5).

This expectation was confirmed. More than 78 percent of those teaching professionally oriented courses chose the "professional development" objective, compared to 21 percent of those teaching general education/distribution courses. On the other hand, over 60 percent of the latter chose the "broad liberal education" objective compared to 39 percent of those teaching professionally oriented courses.

Student progress ratings on these objectives were compared for the two types of classes; these comparisons were limited to classes for which the instructor chose the objective in question as

"relevant." Results followed a similar pattern. Progress ratings were significantly higher on the professional development objective in professionally oriented courses (4.15 vs. 3.85 for classes focused on meeting general education/distribution requirements). Conversely, the latter averaged 3.72 on the broad liberal education objective compared to 3.63 for professionally oriented classes. In both instances, the "t" test was significant beyond the .001 level.

Since both "relevance" and progress ratings were consistent with those expected if the IDEA system were valid, further confirmation of validity was provided.

A final validity study centered on measures used to adjust student ratings. A number of studies have established that students give a much higher priority to courses that prepare them for a profession than for those aimed at a general or liberal education. Therefore, those teaching courses related to the student's major interest should receive ratings indicative of higher student motivation than those teaching courses designed to meet general education or distribution requirements. Relevant measures of motivation are Items 36 and 39 (*I had a strong desire to take this course; I really wanted to take this course regardless of who was teaching it*). Results of these two items for five types of classes are given in Table 21. Both F tests were significant beyond the .0001 level.

Table 21
Motivation Ratings by Principle Type of Student Enrolled in the Class

Type of Student	36. Strong desire to take this course		39. Wanted to take course regardless of who taught it	
	Mean	s.d.	Mean	s.d.
Lower Division, General Education	3.34	.65	3.11	.55
Upper Division, General Education	3.55	.61	3.21	.54
Lower Division, Specialized	3.86	.68	3.49	.55
Upper Division, Specialized	3.86	.60	3.44	.51
Graduate/Professional	3.92	.57	3.49	.49

Ratings were made on a 5-point scale where 1=low and 5=high
Note: Analyses reported in Table 21 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

The IDEA system makes adjustments in ratings to take this type of "extraneous circumstance" into account. If adjustments are successful in making the "playing field" more even, then they should be positive for those teaching general education courses and negative for those teaching courses related to the student's major. Table 22 provides data to test the validity of this expectation (and hence the validity of adjustments).

All F tests were significant (P<.0001). Without exception, adjustments for classes designed to meet general education/distribution requirements at the lower division level were positive, ranging from +.02 to +.08 on individual objectives. At the upper division level, adjustments for this type of class were generally positive, although small negative figures were obtained on 4 of the 12 progress ratings. When pairwise comparisons were made, adjustments for upper division general education courses were significantly different (in a positive direction) from upper division courses related to the student's major/professional interests in 15 of the 16 comparisons.

In most comparisons, adjustments for graduate/professional level courses were greater than those for the other four types. This was expected since students in such courses are almost always highly motivated. The high unadjusted ratings in these courses reflect, in part, this motivation[11].

Table 22
Differences Between Adjusted and Unadjusted Ratings
Among Five Types of Classes

Criterion	Type of Class				
	General Education/ Distribution		Specialized/Major		Graduate/ Professional
	Lower Division	Upper Division	Lower Division	Upper Division	
21. Factual knowledge	+.08	+.01	-.06	-.07	-.06
22. Principles and theories	+.07	+.01	-.05	-.07	-.05
23. Applications	+.05	.00	-.04	-.08	-.11
24. Professional skills, viewpoints	+.05	+.01	-.03	-.04	-.08
25. Team skills	+.02	-.02	-.04	-.08	-.14
26. Creative capacities	+.06	.00	-.04	-.10	-.14
27. Broad liberal education	+.06	-.01	-.07	-.12	-.19
28. Communication skills	+.02	-.03	-.04	-..04	-.11
29. Find, use resources	+.06	+.02	-.02	-.05	-.08
30. Values development	+.06	.00	-.08	-.07	-.09
31. Critical analysis	+.02	-.01	-.04	-.06	-.09
32. Interest in learning	+.08	+.02	-.06	-.09	-.09
Progress on Relevant Objectives[a]	+1.27	+1.33	-1.40	-1.94	-1.32
Increased positive attitude	+.08	+.04	-.10	-.08	-.11
Excellent teacher	+.04	.00	-.02	-.05	-.08
Excellent course	+.11	+.06	-.08	-.08	-.12

[a]Progress on Relevant Objectives ratings are standardized T Scores. The distribution has a mean of 50 and standard deviation of 10. All other ratings were made on a 5-point scale where 1=low and 5=high.
Note: Analyses reported in Table 22 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

Since these results were in line with expectations, it can be concluded that there is validity in the IDEA system's adjustments.

VI. Other Technical Questions

This section addresses two questions that, while relevant to the interpretation of IDEA results, don't fit into any of the previous five sections. These questions are:

1. Are results on the Diagnostic and Short Form comparable?
2. Are there significant differences among disciplines?

1. Comparability of Diagnostic and Short Forms

Initially, the two forms were compared by examining the averages for student ratings of progress on relevant objectives (those chosen as "Important" or "Essential" by the instructor) as well as on the three global ratings of effectiveness (increased positive attitude toward the subject, excellence of the teacher, and excellence of the course). Results are shown in Table 23.

Table 23
Comparison of Ratings on the IDEA Diagnostic Form
And the IDEA Short Form

	Diagnostic Form				Short Form		
Objective	**N**	**Mean**	**S. D.**		**N**	**Mean**	**S. D.**
Factual knowledge	31,990	4.00	.49		21,301	4.20	.46
Principles and theories	30,394	3.94	.48		20,404	4.14	.46
Applications	30,437	3.99	.52		19,254	4.12	.49
Professional skills, viewpoints	21,564	4.04	.52		15,042	4.12	.49
Team skills	12,085	3.93	.63		7,307	4.02	.61
Creative capacities	9,288	3.87	.70		7,419	3.97	.61
Broad liberal education	10,254	3.69	.73		6,988	3.89	.65
Communication skills	18,170	3.79	.68		10,944	3.87	.63
Find, use resources	15,652	3.73	.57		9,690	3.83	.53
Values development	8,713	3.78	.63		5,707	3.87	.60
Critical analysis	18,905	3.84	.59		11,331	3.96	.55
Interest in learning	15,612	3.79	.56		10,104	3.92	.53
Overall Measure							
Increased positive attitude	44,447	3.86	.60		28,827	3.98	.58
Excellent teacher	44,447	4.18	.64		28,827	4.25	.60
Excellent course	44,447	3.92	.61		28,827	4.00	.59

A consistent difference favoring the Short Form is apparent. For the 12 individual objectives, these differences averaged .119; for the three global ratings, they averaged .090. Differences of this magnitude are significant in both the statistical and the practical sense. The practicality of these differences is especially apparent when the distribution of ratings on the two forms is examined. See Table 24.

Table 24
Diagnostic and Short Form Distribution of Means of Progress Ratings and Global Items (in Percentages)

Criterion	Form[a]	Range of Means						
		<2.00	2.00-2.49	2.50-2.99	3.00-3.49	3.50-3.99	4.00-4.49	4.50+
21. Factual knowledge	D	0.05	0.34	1.79	8.04	26.68	42.28	20.83
	S	0.01	0.13	0.78	3.87	16.81	42.18	36.21
22. Principles and theories	D	0.04	0.32	2.11	9.33	28.78	42.40	16.01
	S	0.02	0.13	0.95	4.71	20.11	43.69	30.39
23. Applications	D	0.05	0.33	2.15	8.97	26.62	39.88	22.00
	S	0.02	0.21	1.20	5.73	20.40	41.32	31.14
24. Professional skills, viewpoints	D	0.04	0.36	1.90	8.08	23.44	39.18	27.00
	S	0.03	0.22	1.21	5.84	20.51	40.63	31.56
25. Team skills	D	0.29	1.26	3.72	9.99	23.25	35.86	25.63
	S	0.09	0.95	3.43	8.60	20.54	34.41	31.98
26. Creative capacities	D	0.59	1.78	5.25	10.69	22.89	32.17	26.64
	S	0.21	0.91	3.11	9.68	22.88	36.16	27.04
27. Broad liberal education	D	0.75	2.94	7.88	15.09	24.68	28.71	19.95
	S	0.20	1.54	4.70	12.69	22.86	32.68	25.34
28. Communication skills	D	0.54	1.85	5.70	13.23	25.49	33.37	19.82
	S	0.26	1.31	4.52	12.01	25.36	34.39	22.13
29. Find, use resources	D	0.15	1.12	5.56	16.97	32.91	31.70	11.60
	S	0.02	1.64	3.56	13.95	32.96	35.21	13.67
30. Values development	D	0.30	1.47	5.61	14.69	28.12	32.84	16.98
	S	0.10	0.96	4.70	13.31	26.69	32.91	21.33
31. Critical analysis	D	0.16	1.09	4.57	12.51	27.99	36.53	17.16
	S	0.02	0.58	2.99	10.74	25.48	37.25	22.94
32. Interest in learning	D	0.10	0.87	4.71	15.17	31.91	33.52	13.71
	S	0.04	0.42	2.93	10.88	30.09	37.12	18.50
40. Increased positive attitude	D	0.19	1.00	4.42	12.57	27.05	34.59	20.19
	S	0.09	0.70	3.08	9.46	23.12	36.77	26.78
41. Excellent teacher	D	0.23	0.82	2.37	5.88	14.14	28.79	47.76
	S	0.13	0.52	1.86	4.96	13.24	28.92	50.38
42. Excellent course	D	0.16	0.94	3.79	11.21	24.94	34.90	24.06
	S	0.11	0.67	3.01	9.10	22.47	35.70	28.93

[a]D=Diagnostic Form, S=Short Form

A number of studies were conducted to try to account for these differences.

One study restricted the comparison of the two forms to classes that were taught by the same method (e. g., "Lecture/Discussion," "Skill/Activity," etc.). No reduction in differences was found for these more homogeneous groups.

Similar conclusions were drawn when comparisons were restricted to groups of classes that were directed to the same audiences (lower division classes for students seeking to meet general education or distribution requirements; upper division classes directed to specialization interests of students; etc.). The advantage of Short Form users could not be accounted for by their tendency to teach different types of students than was true for Diagnostic Form users.

A special study was made of PRO and the three global ratings at eight institutions that had administered approximately equal numbers of both forms in at least 100 classes. Although in general the Short Form's advantage was still apparent, there were some differences among institutions. Of the 32 comparisons (4 measures for each of 8 institutions), the Short Form mean was higher in 20; but the Diagnostic Form had higher means 7 times, and the two were about equal on the other 5 comparisons.

Disciplinary differences were examined by comparing results on the two forms for the eight disciplines where both forms were most commonly used. Differences were relatively small in Engineering and Communications departments, but relatively large in Philosophy and General Liberal Arts classes. This study was refined by restricting it to the 36 institutions that regularly employed both forms. "Within institutional disciplinary differences" were similar to those found when disciplinary differences were studied across all institutions.

The most crucial test was made when the comparison was restricted to the 465 classes taught by the same instructor on two occasions—once using the Diagnostic Form and once using the Short Form. In this study, only 2 of the 15 comparisons produced significant differences; and the magnitude of the significant differences was about .10 less than that found in the original studies.

Finally, the IDEA on-campus coordinators on campuses where substantial use was made of both forms were consulted. In most instances, these coordinators reported that the Short Form was employed with faculty members whose effectiveness had been well established (tenured faculty, others with significant amounts of experience, etc.). In contrast, the Diagnostic Form was typically required of junior, temporary, or part-time faculty.

These reports offered strong support for the view that differences between the two forms were artifacts of campus policies that appeared to assure an advantage to the Short Form. When coupled with the findings for the "same course, same instructor" study, it was concluded that true differences between the two forms were, at most, minor. The decision to restrict all normative reporting to the Diagnostic Form meant that norms would reflect the full range of faculty users, not a set that represents established, veteran teachers.

2. Disciplinary differences

Do results on the IDEA forms differ for different disciplines? This question has been a major focus of IDEA's research program. The short answer is, "Results differ significantly across disciplines, and some of these differences are substantial." The question requires relatively complex and detailed analysis. Therefore, it will be addressed in the Center's next technical report. In this report, a sample of disciplinary differences is provided below.

A minimum of 500 classes was required before a discipline was considered in these analyses. A total of 28 disciplines met this standard. Among other matters, the degree to which these disciplines identified each objective as "relevant" ("important" or "essential") was determined. Similarly, for those classes in which the objective was chosen as relevant, the average progress rating was computed. These results are summarized below for two of the twelve objectives, *Creative Capacities* and *Critical Analysis,* in Table 25.

Table 25
Disciplinary Differences in Relevance and Progress Ratings
For Two Learning Objectives

Discipline	Objective			
	Creative Capacities		Critical Analysis	
	% Relevant[a]	Average Progress[b]	% Relevant[a]	Average Progress[b]
Accounting	5.5	3.06	29.0	3.64
Admin/Management	14.8	3.66	46.2	3.98
Art	83.2	4.38	36.1	3.78
Biology/Life Science	7.2	3.15	30.1	3.61
Business – General	15.6	3.65	48.2	3.83
Chemistry	5.8	2.67	26.7	3.31
Communications	42.3	4.13	56.7	3.98
Computer/Information Sciences	20.3	3.46	24.0	3.37
Design/Applied Arts	69.0	4.01	40.4	3.84
Economics	6.2	2.82	46.0	3.65
Education – General	24.6	4.06	45.9	4.07
Engineering	20.2	3.31	26.4	3.38
English Literature	45.8	4.27	72.2	4.10
Fine and Applied Arts	69.0	4.17	39.1	3.83
Foreign Language/Literature	27.4	3.71	24.9	3.65
History	17.6	3.48	69.3	3.98
Health Professions/Related Science	8.8	3.78	32.5	3.93
Liberal Arts/General Studies	29.0	3.98	67.6	4.07
Mathematics/Statistics	6.3	2.78	22.8	3.30
Music	64.1	4.29	19.6	3.59
Nursing	7.7	3.69	42.0	4.14
Philosophy	16.4	3.64	93.1	4.37
Physical Education/ Health/ Safety	14.5	3.60	29.7	3.63
Physics	6.7	2.69	36.1	3.23
Political Science/Government	15.8	3.47	73.5	4.17
Psychology	7.5	3.54	53.7	3.93
Religion	13.7	3.46	60.1	4.12
Sociology	13.9	3.50	64.9	4.01

[a]Percent identifying objective as "important" or "essential."

[b]Ratings were made on a 5-point scale where 1=low and 5=high.

Note: Analyses reported in Table 25 used a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

Instructors indicated that gains in *Creative Capacities* represented an "Important" or "Essential" objective in over half of the classes in Art, Design/Applied Arts, Fine and Applied Arts, and Music. In contrast, it was considered "Of no more than minor importance" in over 90 percent of the classes in Accounting, Biological/Life Science, Chemistry, Economics, Health Professions, Mathematics/Statistics, Physics, and Psychology. The average progress rating in relevant (important; essential) classes was much higher in disciplines that featured this objective than in those where it was rarely chosen (4.21 for disciplines where this objective was popular; 3.13 for those where it was rarely

chosen).

Findings for the *Critical Analysis* objective were similar. It was considered relevant in over two-thirds of the classes in English Literature, History, Liberal Arts/General Studies, and Philosophy (where it was rated as relevant in over 93 percent of all classes). But it was rated as relevant in fewer than twenty-five percent of the classes in Computer/Information Sciences, Foreign Language/Literature, Mathematics/Statistics, and Music. Again, progress ratings paralleled these differences, averaging 4.08 for disciplines where it was commonly chosen and 3.48 for those where it was infrequently chosen.

These findings illustrate some of the very large differences among disciplines. Because these are so extensive, a full accounting will be delayed until the publication of a subsequent technical report.

Appendix A

Faculty Information Form
Diagnostic Form
Short Form (used Fall 1998-Summer 2002)
Short Form (revised Fall 2002)
Sample IDEA Report (Diagnostic Form)
Sample IDEA Short Form Report (reflects adjustments described in Appendix C)

Appendix B

Calculating Scores Reported in *The IDEA Report*
(Diagnostic Form) for Individual Faculty Members

Appendix A includes a sample of the report participants receive for each class. The figures on this report were computer-generated. For those who would like to calculate these figures by hand, either to check their accuracy or to get a better feel for what goes into a given calculation, Appendix B describes the process that is followed in making calculations.

I. Necessary Raw Data

A. National data base results for progress ratings on "relevant" classes (those in which the instructor identified the objective as "Important" or "Essential").

Objective	Mean	s. d.	R^2
21. Gaining factual knowledge. . .	4.0013	.494	.1761
22. Learning principles, theories. . .	3.9443	.485	.1633
23. Applying course material. . .	3.9874	.516	.2248
24. Developing professional skills, competency. . .	4.0420	.524	.2380
25. Acquiring team skills. . .	3.9285	.632	.1611
26. Developing creative capacities. . .	3.8668	.701	.1940
27. Gaining a broad liberal education. . .	3.6948	.732	.1648
28. Developing communication skills. . .	3.7887	.676	.1930
29. Learning to find and use necessary recourses. . .	3.7322	.571	.1687
30. Values development, clarification. . .	3.7779	.629	.1599
31. Learning to critically evaluate. . . .	3.8438	.589	.1186
32. Acquiring interest in learning more. . .	3.7907	.561	.2056

B. Means and standard deviations of ratings on three "global outcomes" measures.

	Mean	s. d.	R^2
40. Increased positive feelings toward subject. . .	3.8611	.602	.3606
41. Overall, instructor was excellent. . .	4.1815	.642	.0883
42. Overall, course was excellent. . .	3.9198	.607	.2938

C. Information from statistical detail (Section V, page 7, of IDEA Report)

	Mean	
Progress on Essential Objectives	Reported	Calculated
21. Factual knowledge. . .	3.7	3.7241
22. Principles, theories. . .	3.7	3.7241
Progress on Important Objectives		
23. Applying course material. . .	4.1	4.0690
31. Learning to critically evaluate. . .	3.9	3.9310
Global Ratings		
40. Increased positive feelings toward subject. . .		
3.7	3.6552	
41, Overall, instructor was excellent. . .	4.6	4.5517
42. Overall, course was excellent. . .	3.9	3.8966
Items Needed to Make Adjustments		
39. Course motivation. .		
.		3.1
3.1034		
43. Work habits. . .	3.3	3.3448
Number enrolled (page 1 of IDEA Report)	34	--
8. Stimulated high intellectual effort. . .	3.8	3.7931
33. Amount of reading. . .	3.1	3.1034
34. Amount of other work. . .	3.4	3.3929

35. Difficulty of course. . .	3.6	3.6429
37. Effort (worked harder than normal. . .)	3.7	3.6897

II. Preliminary Calculations

A. Calculating D_N

D_N = Mean of Item 35 minus Predicted Mean of Item 35; or $D_N = X_{35} - \text{Pred } X_{35}$

$\text{Pred } X_{35} = .13412\ X_8 + .23986\ X_{33} + .40303\ X_{34} + .74331$ (Technical Report , p. 37)

$= .5097 + .7436 + 1.3703 + .7433 = 3.3669$

$D_N = 3.6429 - 3.3669 = \underline{.2760}$

B. Calculating E_N

$E_N = X_{37} - \text{Pred } X_{37}$

$\text{Pred } X_{37} = .35690\ X_8 + .11142\ X_{33} + .51595\ X_{34} + .06562$ (Tech Report, p. 37)

$= 1.3562 + .3454 + 1.7542 + .0656 = 3.5214$

$E_N = 3.6897 - 3.5214 = \underline{.1683}$

III. Calculating Adjusted Scores (from formulas on p. 38 of Technical Report)

Adjusted progress rating on Item 21, Gaining factual knowledge. . .

Predicted X_{21} = .27568 X_{39} + .38141 X_{43} + .09434 D_N -.0722 E_N +1.69981

= .8555 +1.2757 +.0260 -.0122 +1.6998 = 3.8448

Residual = X_{21} – Pred. X_{21} = 3.7241-3.8448 = -.1207

Adjusted X_{21} = Grand Mean, Item 21 +(Residual)(1 + R^2)

= 4.0013 + (-1207)(1.1761) = 4.0013 - .1420 = 3.8593 (IDEA Report, p. 3)

Adjusted progress rating on Item 22, Learning principles and theories. . .

Predicted X_{22} = .25225X_{39}+.39835X_{43}-.001N+.09683D_N-.1244E_N+1.67488

= .7828 +1.3324 -.0340 +.0267 -.0209 +1.6750 = 3.7620

Residual = X_{22} – Pred X_{22} = 3.7241 – 3.7620 = -.0379

Adjusted X_{22} = Grand Mean, Item 22 + (Residual)(1 + R^2) =

3.9443 + (-.0379)(1.1633) = 3.9443 - .0441 = 3.9002 (IDEA Report, p. 3)

Adjusted progress rating on Item 23, Applications of course materials

Predicted X_{23} = .27966X_{39}+.43610X_{43}-.003N-.1076D_N-.1221E_N+1.055086

= .8679 +1.4587 -.102 -.0297 -.0206 +1.5509 = 3.7252

Residual = X_{23} – Pred. X_{23} = 4.0690 -3.7252 = .3438

Adjusted X_{23} = Grand Mean, Item 23 + (Residual)(1 + R^2)

= 3.9874 + (.3438)(1.2248) = 3.9874 + .4211 = 4.4085 (IDEA Report, p. 3)

Adjusted progress rating on Item 31, Analysis and critical evaluation

Predicted X_{31} = .13407X_{39}+.42156X_{43}-.004N-.1995D_N-.1523E_N+1.96267

= .4160 +1.4100 -.136 -.0051 -.0256 +1.9627 = 3.5720

Residual = X_{31} – Pred. X_{31} = 3.9310 – 3.5720 = .3590

Adjusted X_{31} = Grand Mean, Item 31 + (Residual)(1 + R^2)

= 3.8438 + (.3590)(1.1186) = 3.8438 + .4016 = 4.2454 (IDEA Report, p. 3)

Adjusted rating, Item 40—Increased positive attitude.

Predicted X_{40} = .51242X_{39}+.33205X_{43}-.001N-.2234D_N+.0743E_N+1.00177

= 1.5902 +1.1106 -.034 -.0617 +.0125 +1.0018 = 3.6194

Residual = X_{40} – Pred. X_{40} = 3.6552 – 3.6194 = .0358

Adjusted X_{40} = Grand Mean, Item 40 + (Residual)(1 + R^2)

= 3.8611 + (.0358)(1.3606) = 3.8611 + .0487 = 3.9098 (IDEA Report, p. 2)

Adjusted rating, Item 41—Excellence of teacher

Predicted X_{41} = .24024X_{39}+.23139X_{43}-.001N-.1475D_N-.1819E_N+2.58021

= .7523 +.7740 -.034 -.0407 -.0306 +2.5802 = 4.0012

Residual = X_{41} – Pred. X_{41} = 4.5517 – 4.0012 = .5505

Adjusted X_{40} = Grand Mean, Item 41 + (Residual)(1 + R^2)

= 4.1815 + (.5505)(1.0883) = 4.1815 + .5991 = 4.7806 (IDEA Report, p. 2)

Adjusted rating, Item 42—Excellence of course.

Predicted X_{42} = .47249X_{39}+.28732X_{43}-.001N-.2141D_N+.0530E_N+1.35036

= 1.4663 +0.9610 -.034 -.0591 +.0089 +1.3504 = 3.6935

Residual = X_{42} – Pred. X_{42} = 3.8966 – 3.6935 = .2031

Adjusted X_{42} = Grand Mean, Item 42 + (Residual)(1 + R^2)

= 3.9198 + (.2031)(1.2938) = 3.9198 + .2628 = 4.1826 (IDEA Report, p. 2)

IV. Calculating T Scores

T Score = 50+[10(Obtained Mean-Grand Mean) divided by s.d.], where Grand Mean is National Mean and s.d is National standard deviation. Obtained mean for unadjusted T Score is the raw mean. The Obtained mean for the adjusted T Score is the adjusted mean calculated above.

	Mean Scores A=Obtained-Nat'l	B=Nat'l s. d.	.10(A/B) - IDEA Report Page
Item 21			
Unadjusted	3.7241-4.0013= -.2772	.494	-5.61 (+50 = 44, p. 3)
Adjusted	3.8593-4.0013= -.1420	.494	-2.87 (+50 = 47, p. 3)
Item 22			
Unadjusted	3.7241-3.9443= -.2202	485	-4.54 (+50 = 45, p. 3)
Adjusted	3.9002-3,9443= -.0441	.485	-0.91 (+50 = 49, p. 3)
Item 23			
Unadjusted	4.0690-3.9874= +.0816	.516	1.58 (+50 = 52, p. 3)
Adjusted	4.4085-3.9874= +.4211	.516	8.16 (+50 = 58, p. 3)
Item 31			
Unadjusted	3.9310-3.8438= +.0874	.589	1.48 (+50 = 51, p. 3)
Adjusted	4.2454-3.8438= +.4016	.589	6.82 (+50 = 57, p. 3)
Item 40			
Unadjusted	3.6552-3.8611= -.2059	.602	-3.42 (+50 = 47, p. 2)
Adjusted	3.9098-3.8611= +.0487	.602	0.81 (+50 = 51, p. 2)
Item 41			
Unadjusted	4.5517-4.1815= +.3702	.642	5.77 (+50 = 56, p. 2)
Adjusted	4.7806-4.1815= +.5991	.642	9.53 (+50 = 60, p. 2)
Item 42			
Unadjusted	3.8966-3.9198= -.0232	.607	0.38 (+50 = 50, p. 2)
Adjusted	4.1826-3.9198= +.2628	.607	4.53 (+50 = 55, p. 2)

PRO

Unadjusted 2(44 +45) + (52 +51) = 178 + 103 = 281 divided by 6 = 46.8 (p. 2)

Adjusted 2(47 + 49) + (58 + 57) = 192 + 115 = 307 divided by 6 = 51.2 (p. 2)

Appendix C

Regression Coefficients and Constants for Adjusting Ratings on the Revised Short Form Effective October 1, 2002

Adjusted Mean	Constant	CM_{15} C_1	WH_{13} C_2	#Enroll C_3	1+Adj.R^2	Grand Mean
Item 21	1.7559	0.2572	0.3842	0	1.1737	4.0013
Item 22	1.7619	0.2273	0.3941	0	1.1593	3.9443
Item 23	1.7019	0.2663	0.4096	-0.00298	1.2050	3.9874
Item 24	1.5353	0.3139	0.4131	-0.00303	1.2304	4.0420
Item 25	1.6622	0.1700	0.4742	0	1.1119	3.9285
Item 26	1.8617	0.2191	0.4190	-0.01188	1.1201	3.8668
Item 27	1.3038	0.2344	0.4871	-0.00534	1.1174	3.6948
Item 28	2.4763	0.0324	0.3887	-0.00849	1.0599	3.7887
Item 29	1.6477	0.1114	0.5054	-0.00569	1.1252	3.7322
Item 30	1.4258	0.2189	0.4502	0	1.1088	3.7779
Item 31	2.2063	0.1118	0.3839	-0.00432	1.0754	3.8438
Item 32	1.4911	0.2457	0.4491	-0.00624	1.1881	3.7907
Item 40	0.9700	0.5363	0.3222	-0.00162	1.3396	3.8611
Item 41	2.8111	0.2197	0.1912	-0.00182	1.0600	4.1815
Item 42	1.3442	0.4922	0.2748	-0.00191	1.2737	3.9198

CM_{15}=Course Motivation – Short Form Item 15. *I really wanted to take this course regardless of who taught it.*

WH_{13}=Student Work Habits – Short Form Item 13. *As a rule, I put forth more effort than other students on academic work.*

#Enrolled=Number of students enrolled in the course as indicated by the instructor on the Faculty Information Form.

Note: Analyses are based on a more restricted data set. Classes with response rates less than 75% or not reporting the number enrolled were also excluded.

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[1] Copies of the instruments and sample copies of reports to participants are included in Appendix A.

[2] Institutions that were first-time participants in the IDEA program were excluded, as were classes with fewer than 10 respondents. Furthermore, if a single institution contributed more than 5% of the classes processed in a given year, classes from that institution were randomly deleted until the remainder constituted only 5% of the total.

[3] T=50+[10(X-M)/SD] where X=mean for the instructor; M=mean for the comparison group; SD=standard deviation for the comparison group.

[4] Lawley, D. N. (1940) "The Estimation of Factor Loadings for the Method of Maximum Likelihood," *Proceedings/The Royal Society of* Edinburgh, 60, 64-82. Kaiser, H. F. (1958), "The Varimax Criterion for Analytic Rotation in Factor Analysis," *Psychometrika*, 23, 187-200.

[5] National Survey of Student Engagement. *National Benchmarks of Effective Educational Practice*. Indiana University Center for Postsecondary Research and Planning: Bloomington, Indiana, 2001.

[6] Hocking, R. R. (1976) "The Analysis and Selection of Variables in Linear Regression," *Biometrics*, 32, 1-50.

[7] Conceivably, this may be because ratings of this characteristic are determined almost exclusively by instructor behavior rather than by extraneous circumstances. Ratings on Item 10 *Explained course material clearly and concisely*, correlated .90 with overall ratings of the instructor (Item 41). See Table 6.

[8] $$r_{xx} = \frac{nr_{11}}{1 + (n-1)r_{11}}$$

[9] Standard deviations were calculated for the 44,447 classes with 10 or more respondents processed between 1998 and 2001. Items 21-32 (progress ratings) were exceptions to this; for these items, only "relevant" classes (those for which the objective was selected as "important" or "essential") were used in computing standard deviations.

[10] Cronback, L. J. (1951) "Coefficient Alpha and the Internal Structure of Tests," *Psychometrika*, 16, 297-334.

[11] Lower adjusted scores for such classes do not necessarily mean that unadjusted ratings overestimate instructional effectiveness. Rather, the quality of instruction is less vital in such classes since high student motivation and energy almost ensures high levels of progress.

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